

UNCLASSIFIED

AD NUMBER
AD876737
NEW LIMITATION CHANGE
TO Approved for public release, distribution unlimited
FROM Distribution authorized to U.S. Gov't. agencies and their contractors; Critical Technology; OCT 1970. Other requests shall be referred to Air Force Aero Propulsion Laboratory, Attn: APF, Fuel, Lubrication, and Hazards Division, Wright-Patterson AFB, OH 45433.
AUTHORITY
AFAPL ltr, 25 May 1973

THIS PAGE IS UNCLASSIFIED

AD876737

AFAPL-TR-70-59
VOLUME II

AD No. _____

DDC FILE COPY

**EVALUATION STUDY OF THE
OXIDATION-CORROSION-DEPOSITION
CHARACTERISTICS OF AIRCRAFT TURBINE
ENGINE LUBRICANTS**

J. P. Cuellar

B. B. Baber

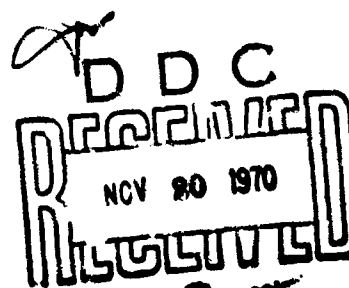
Southwest Research Institute

TECHNICAL REPORT AFAPL-TR-70-59, VOLUME II

October 1970

THIS DOCUMENT IS SUBJECT TO SPECIAL EXPORT CONTROLS AND EACH TRANSMITTAL TO FOREIGN GOVERNMENTS OR FOREIGN NATIONALS MAY BE MADE ONLY WITH PRIOR APPROVAL OF THE FUEL, LUBRICATION, AND HAZARDS DIVISION (APF), AIR FORCE AERO PROPULSION LABORATORY, WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433.

**Air Force Aero Propulsion Laboratory
Air Force Systems Command
Wright-Patterson Air Force Base, Ohio**



NOTICE

When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

ACCESSION FOR	
CFSTI	WHITE SECTION <input type="checkbox"/>
DDC	DIFF SECTION <input checked="" type="checkbox"/>
UNANNOUNCED	<input type="checkbox"/>
JUSTIFICATION	
BY	
DISTRIBUTION/AVAILABILITY CODE	
DISC.	AVAIL. and/or SPECIAL
2	

Copies of this report should not be returned unless return is required by security considerations, contractual obligations, or notice on a specific document.

EVALUATION STUDY OF THE OXIDATION-CORROSION-DEPOSITION CHARACTERISTICS OF AIRCRAFT TURBINE ENGINE LUBRICANTS

J. P. Cuellar

B. B. Baber

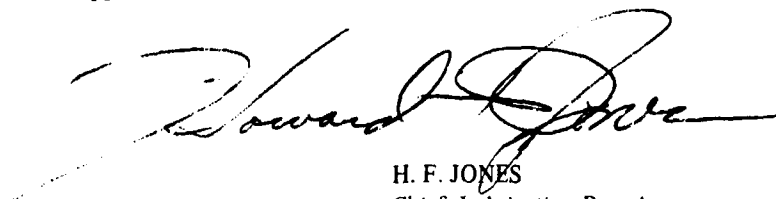
THIS DOCUMENT IS SUBJECT TO SPECIAL EXPORT CONTROLS AND EACH TRANSMITTAL TO FOREIGN GOVERNMENTS OR FOREIGN NATIONALS MAY BE MADE ONLY WITH PRIOR APPROVAL OF THE FUEL, LUBRICATION, AND HAZARDS DIVISION (APF), AIR FORCE AERD PROPULSION LABORATORY, WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

FOREWORD

This report was prepared by Southwest Research Institute, 8500 Culebra Road, San Antonio, Texas, under Contract F33615-69-C-1295, Project No. 3048. The work was administered by the Lubrication Branch, Air Force Aero Propulsion Laboratory (AFAPL), Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. The project engineers were Messrs. G. A. Beane, L. J. DeBrohun, and H. A. Smith (APFL).

This report covers one phase of work performed under the subject contract. This report was submitted by the authors in June 1970.

This technical report has been reviewed and is approved.

A handwritten signature in dark ink, appearing to read "Howard Jones", is written over the printed name and title.

H. F. JONES
Chief, Lubrication Branch,
Fuel, Lubrication, and
Hazards Division
Air Force Aero Propulsion
Laboratory

ABSTRACT

Volume II of this report contains a compilation of the individual test data sheets for all tests included in Volume I. The data sheets are presented in order of test number.

This abstract is subject to special export controls and each transmittal to foreign governments or foreign nationals may be made only with prior approval of the Fuel, Lubrication, and Hazards Division (APF), Air Force Aero Propulsion Laboratory, Wright-Patterson Air Force Base, Ohio 45433.

TEST NO. 336-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 347°F.

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34	—	4.58	0.26	9
7 days	16.96	-2.2	4.47	1.14	
14 days	15.87	-8.5	4.13	2.76	
21 days	215.1	+1140	29.83	49.6	
26 days	(a)	—	—	59.7	

Metal Specimen Data			Test Cell Data	
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter (a)
	Ti	-0.34		Centrifuge, vol % 80
	Ag	-0.10	Tube deposits:	Total demerits 334
	Steel	-0.66		
	Cu	-3.24		
		Mg	-2.02	Breakpoint Data
Metal discoloration, deposits, pitting, or etching:	Al	Yellow	Neut. no., days to 1 mg KOH/g/4 days	12
	Ti	L pitting	100°F vis, days to 1 cs/4 days	16
	Ag	Yellow	Test Conditions	
	Steel	L pitting	Sample temperature, °F	347
	Cu	H etching	Sample volume, ml	200
	Mg	H etching	Air rate, liters/hr	10
			Condensate return	Yes

(a) Semisolid—analysis not possible.

TEST NO. 336-2, RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.04	—	3.47	0.24	
7 days	13.23	1.5	3.47	1.77	
14 days	13.23	1.5	3.42	3.40	
21 days	22.92	75.8	4.83	37.9	
26 days	55.97	329	10.43	55.2	2

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.76		Centrifuge, vol. %	2
	Ag	0.10	Tube deposits:	Total elements	114
	Steel	0.00			
	Cu	1.00			
	Mg	0.66	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., days to 1 mg KOH/g/4 days		13
	Ti	M pitting		100°F vis, days to 1 cs/4 days	
	Ag	1 yellow	Test Conditions		
	Steel	1 brown	Sample temperature, °F	347	
	Cu	1 etching	Sample volume, ml	200	
	Mg	M etching	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 336-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.87	—	3.69	0.04	1
7 days	15.10	1.5	3.73	1.13	
14 days	14.97	0.7	3.69	1.42	
21 days	14.97	0.7	3.67	2.02	
26 days	15.08	1.4	3.69	2.13	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	-0.08		Centrifuge, vol %	Trace
	Ag	-0.28	Tube deposits:	Total demerits	28
	Steel	-0.04			
	Cu	-0.24			
	Mg	-1.82			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	Green	Neut. no., days to 1 mg KOH/g/4 days	26+	
	Ag	L pitting	100°F vis, days to 1 cs/4 days	26+	
	Steel	Green	Test Conditions		
	Cu	L pitting	Sample temperature, °F	347	
	Mg	L pitting	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 337-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 392°F

	Vis cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
initial	12.13	—	3.17	0.19	
16 hr	12.82	5.7	3.29	1.61	
24 hr	12.90	6.3	3.30	1.95	
40 hr	13.08	7.8	3.33	3.16	
48 hr	13.31	9.7	3.36	6.90	1
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.22	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.30		Centrifuge, vol %	0.2
	Ag	+0.22	Tube deposits:	Total demerits	314
	Steel	+0.12			
	Cu	-0.14			
	Mg	+0.20			
Metal discoloration, deposits, pitting, or etching:	Al	Brown deposit	Breakpoint Data		
	Ti	Black deposit	Neut. no., hr to 1 mg KOH/g/8 hr	40	
	Ag	Brown deposit	100°F vis, hr to 1 cs/8 hr	48+	
	Steel	L brown	Test Conditions		
	Cu	No change	Sample temperature, °F	392	
	Mg	Black deposit	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 337-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.77	—	3.13	0.24	3
16 hr	13.60	6.5	3.26	0.92	
24 hr	13.77	7.8	3.29	1.05	
40 hr	13.96	9.3	3.32	1.23	
48 hr	14.01	9.7	3.33	1.55	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	8
	Steel	+0.04			
	Cu	+0.18			
	Mg	+0.28	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	No change	100°F vis, hr to 1 cs/8 hr		48+
	Ag	No change	Test Conditions		
	Steel	L yellow	Sample temperature, °F	392	
	Cu	Gold	Sample volume, ml	200	
	Mg	Black deposit	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 337-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34	-	4.58	0.26	
16 hr	16.57	4.4	4.34	1.28	
24 hr	16.17	6.7	4.23	1.68	
40 hr	16.72	3.6	4.03	13.25	
48 hr	18.51	16.7	4.31	18.47	6

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	Trace
	Ag	+0.06	Tube deposits:	Total demerits	86
	Steel	+0.04			
	Cu	0.90			
	Mg	7.26	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching.			Neut. no., hr to 1 mg KOH/g/8 hr		26
			160°F vis, hr to 1 cs/8 hr		43
			Test Conditions		
	Al	1 brown	Sample temperature, °F	392	
	Ti	1 brown	Sample volume, ml	200	
Ag	1 yellow	Air rate, liters/hr	10		
Steel	1 yellow	Condensate return	Yes		
Cu	M pitting				
Mg	H etching				

TEST NO. 337-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.87	—	3.69	0.04	2
16 hr	14.84	-0.2	3.71	1.10	
24 hr	14.80	-0.5	3.67	1.28	
40 hr	14.64	-1.5	3.61	1.97	
48 hr	15.09	+1.5	3.61	6.37	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	+0.04	Tube deposits:	Total demerits	47
	Steel	+0.08			
	Cu	-0.14			
	Mg	+0.10	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		39
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	L brown	Sample temperature, °F	392	
	Ti	L brown	Sample volume, ml	200	
Ag	L yellow	Air rate, liters/hr	10		
Steel	No change	Condensate return	Yes		
Cu	Brown				
Mg	No change				

TEST NO. 337-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.26	—	3.21	0.05	
16 hr	14.14	6.6	3.36	0.76	
24 hr	14.30	7.8	3.35	0.94	
40 hr	14.58	10.0	3.42	1.23	
48 hr	15.09	13.8	3.44	1.48	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	None
	Ti	+0.08		Centrifuge, vol %	None
	Ag	+0.06	Tube deposits:	Total demerits	3
	Steel	+0.08			
	Cu	+0.06			
	Mg	+0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	No change	100°F vis, hr to 1 cs/8 hr		48+
	Ag	No change	Test Conditions		
	Steel	No change	Sample temperature, °F	392	
	Cu	Yellow	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 337-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.48	--	3.25	0.21	
16 hr	14.37	6.6	3.41	0.71	
24 hr	14.51	7.6	3.43	0.85	
40 hr	14.75	9.4	3.47	1.12	
48 hr	14.87	10.3	3.49	1.26	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.08	Tube deposits:	Total demerits	32
	Steel	-0.04			
	Cu	-0.06			
	Mg	+0.04			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	L yellow	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ag	L yellow		100°F vis, hr to 1 cs/8 hr	48+
	Steel	L yellow			
	Cu	Brown	Test Conditions		
	Mg	No change	Sample temperature, °F	392	
		Sample volume, ml	200		
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 337-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.04		3.47	0.24	
16 hr	13.14	0.8	3.44	3.39	
24 hr	13.19	1.2	3.44	2.20	
40 hr	13.23	1.5	3.43	3.02	
48 hr	14.52	11.3	3.58	12.33	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.04	Sludge in oil	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.08	Tube deposits	Total demerits	4
	Steel	+0.12			
	Cu	0.12			
	Mg	0.06			
Metal discoloration, deposits, pitting, or etching	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	37	
	Ag	I tan	100°F vis, hr to 1 cs/8 hr	46	
	Steel	I yellow	Test Conditions		
	Cu	No change	Sample temperature, °F	392	
	Mg	I brown	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 337-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.29	—	3.21	0.00	6
16 hr	14.13	6.3	3.34	0.88	
24 hr	14.29	7.5	3.37	0.63	
40 hr	14.48	9.0	3.40	0.84	
48 hr	14.56	9.6	3.44	1.10	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.14	Sludge in oil:	200-mesh filter	None
	Ti	+0.14		Centrifuge, vol %	None
	Ag	+0.16	Tube deposits:	Total demerits	20
	Steel	+0.06			
	Cu	0.00			
	Mg	+0.08			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	L brown		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Brown	Sample temperature, °F	392	
	Cu	Gold	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 338-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1082^(a) AT 385°F

	Vis, cs/100°F	100°F ¹ / _{vis} Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.11	—	3.85	0.20	
16 hr	15.09	−0.1	3.76	0.63	
24 hr	15.15	+0.3	3.77	0.74	
40 hr	15.07	−0.3	3.69	2.47	
48 hr	17.18	+13.7	3.94	9.89	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	Trace
	Ag	+0.02	Tube deposits:	Total demerits	17
	Steel	−0.02			
	Cu	−0.16			
	Mg	−0.04			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	37	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	40
	Ag	No change	Test Conditions		
	Steel	Gold	Sample temperature, °F	385	
	Cu	L brown	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-7 and O-67-20.					

TEST NO. 339-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-31 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.40	-	3.23	0.08	
24 hr	14.58	8.8	3.38	1.13	
40 hr	14.93	11.4	3.48	1.20	
48 hr	15.08	12.5	3.51	1.29	
64 hr	15.49	15.6	3.60	1.65	
72 hr	15.72	17.3	3.60	2.20	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	-0.14	Tube deposits:	Total demerits	6
	Steel	+0.16		Breakpoint Data	
	Cu	+0.12		Neut. no., hr to 1 mg KOH/g/8 hr	72+
	Mg	-11.26		100°F vis, hr to 1 cs/8 hr	72+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F		
	Ag	L brown			
	Steel	Brown			
	Cu	Brown			
	Mg	M etching			
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 339-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.48	-	3.25	0.21	
24 hr	14.63	8.5	3.44	1.20	
40 hr	15.05	11.6	3.51	1.36	
48 hr	15.33	13.7	3.54	1.69	
64 hr	17.70	31.3	3.88	5.68	
72 hr	20.67	53.3	4.29	10.52	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.06		Centrifuge, vol %	Trace
	Ag	+0.02	Tube deposits:	Total demerits	18
	Steel	+0.02		Breakpoint Data	
	Cu	-0.36		Neut. no., hr to 1 mg KOH/g/8 hr	50
	Mg	0.00		100°F vis, hr to 1 cs/8 hr	56
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F		
	Ag	L yellow			
	Steel	No change			
	Cu	L pitting			
	Mg	No change			
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 340-1. RESULTS OF OXIDATION-CORROSION TEST ON Q-68-8 AT 385°F

	Vis, cs/100°C	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.86	—	4.61	0.19	
16 hr	17.86	0.0	4.53	1.48	
24 hr	No sample (a)	—		2.07	
40 hr	17.70	-0.9	4.49	3.50	
48 hr	17.80	-0.3	4.33	9.92	3

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.14	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.14		Centrifuge, vol %	14
	Ag	+0.18	Tube deposits:	Total dimerits	116
	Steel	+0.04			
	Cu	-0.18			
	Mg	+0.12			
Metal discoloration, deposits, pitting, or etching:	Al	Brown	Breakpoint Data		
	Ti	Green	Neut. no., hr to 1 mg KOH/g/8 hr	36	
	Ag	L yellow	100°F vis, hr to 1 cs/8 hr	48+	
	Steel	Green	Test Conditions		
	Cu	Brown	Sample temperature, °F	385	
	Mg	L brown	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

(a) Sample lost in handling.

TEST NO. 341-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1082^(a) AT 392°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	15.11	—	3.85	0.20	5
16 hr	15.04	-0.5	3.75	0.77	
24 hr	14.98	-0.9	3.71	1.05	
40 hr	17.72	+17.3	4.93	10.66	
48 hr	19.80	+31.0	4.33	15.00	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.16	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.04		Centrifuge, vol %	Trace
	Ag	+0.06	Tube deposits:	Total dimerits	32
	Steel	0.00			
	Cu	-0.32			
	Mg	-0.24			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	28	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	30
	Ag	No change	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	M pitting	Sample volume, ml	200	
	Mg	L pitting	Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-7 and O-67-20.					

TEST NO. 342-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-829 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.88	—	3.47	0.27	2
16 hr	14.26	2.7	3.53	0.90	
24 hr	14.31	3.1	3.53	1.19	
40 hr	14.38	3.6	3.54	1.64	
48 hr	14.73	6.1	3.57	4.56	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	-0.04	Tube deposits:	Total demerits	19
	Steel	-0.02			
	Cu	-0.18			
	Mg	+0.04	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		41
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	L yellow	Sample temperature, °F	392	
	Ti	Brown	Sample volume, ml	200	
	Ag	Yellow	Air rate, liters/hr	10	
Steel	Blue	Condensate return	Yes		
	Cu	Brown & orange			
	Mg	L yellow			

TEST NO. 342-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-830 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.62	—	3.39	0.80	
16 hr	13.99	2.7	3.46	1.12	
24 hr	14.16	4.0	3.50	1.34	
40 hr	17.62	29.4	4.06	9.31	
48 hr	19.33	41.9	4.24	14.45	1
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	3.7 g
	Ti	-0.04		Centrifuge, vol %	0.6
	Ag	-0.10	Tube deposits:	Total demerits	100
	Steel	0.00			
	Cu	-0.14			
	Mg	+0.02			
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Breakpoint Data		
	Ti	Brown	Neut. no., hr to 1 mg KOH/g/8 hr	29	
	Ag	Yellow	100°F vis, hr to 1 cs/8 hr	26	
	Steel	Blue	Test Conditions		
	Cu	Brown & orange	Sample temperature, °F	392	
	Mg	L yellow	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 342-3, RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-831 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.52	—	3.48	0.28	3
16 hr	15.60	7.4	3.68	0.56	
24 hr	15.74	8.4	3.68	0.79	
40 hr	15.94	9.8	3.71	1.08	
48 hr	16.04	10.5	3.72	3.27	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.08		Centrifuge, vol %	0.6
	Ag	-0.06	Tube deposits:	Total demerits	39
	Steel	-0.04			
	Cu	-0.16			
	Mg	+0.06			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	42	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		Sample temperature, °F
	Steel	Dark blue		Sample volume, ml	200
	Cu	Brown & orange		Air rate, liters/hr	10
	Mg	No change		Condensate return	Yes

TEST NO. 342-4, RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-832 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.76	—	3.37	0.31	3
16 hr	14.66	6.5	3.52	0.48	
24 hr	14.83	7.8	3.52	0.76	
40 hr	15.03	9.2	3.57	1.23	
48 hr	15.36	11.6	3.61	2.18	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.02	Sludge in oil: 200-mesh filter Centrifuge, vol %	Trace 0.4	
	Ti	−0.08			
	Ag	−0.10			
	Steel	−0.06			
	Cu	−0.14			
	Mg	+0.14			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Tube deposits: Total demerits	53	
	Ti	No change			
	Ag	L yellow			
	Steel	Dark blue			
	Cu	Brown & orange			
	Mg	L blue			
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr		44
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
			Sample temperature, °F		392
			Sample volume, ml		200
			Air rate, liters/hr		10
			Condensate return		Yes

TEST NO. 343-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	12.12	—	3.19	0.20	2	
16 hr	12.87	6.2	3.30	1.48		
24 hr	12.91	6.5	3.31	1.80		
40 hr	12.97	7.0	3.34	2.65		
48 hr	12.89	6.4	3.30	3.40		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	+0.16	Sludge in oil:	200-mesh filter	Trace	
	Ti	+0.20		Centrifuge, vol %	Trace	
	Ag	+0.12	Tube deposits:	Total demerits	362	
	Steel	+0.12		Breakpoint Data		
	Cu	−0.28		Neut. no., hr to 1 mg KOH/g/8 hr	47	
	Mg	+0.10		100°F vis, hr to 1 cs/8 hr	48+	
Metal discoloration, deposits, pitting, or etching:	Al	Dark brown	Test Conditions			
	Ti	Black deposit	Sample temperature, °F			
	Ag	Dark brown				
	Steel	Black				
	Cu	L pitting				
	Mg	Black				
			Sample volume, ml			
			Air rate, liters/hr			
			Condensate return			

TEST NO. 343-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	12.77	--	3.13	0.24	2
16 hr	13.52	5.9	3.24	0.71	
24 hr	13.67	7.0	3.27	0.91	
40 hr	13.92	9.0	3.31	1.16	
48 hr	13.95	9.2	3.32	1.39	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.10	Tube deposits:	Total demerits	2
	Steel	-0.02		Breakpoint Data	
	Cu	+0.10		Neut. no., hr to 1 mg KOH/g/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Mg	0.00	100°F vis, hr to 1 cs/8 hr	48+	
	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	392	
	Ag	No change	Sample volume, ml	200	
	Steel	Blue-green	Air rate, liters/hr	10	
Cu	Gold	Condensate return	Yes		
Mg	No change				

TEST NO. 343-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34	-	4.58	0.26	
16 hr	16.80	-3.1	4.40	1.12	
24 hr	16.56	-4.5	4.33	1.41	
40 hr	15.44	-11.0	3.89	8.16	
48 hr	16.66	-3.9	4.01	15.39	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	-0.04	Tube deposits:	Total demerits	116
	Steel	0.00			
	Cu	-0.76			
	Mg	-1.20			
Metal discoloration deposits, pitting, or etching:	Al	L yellow	Neut. no., hr to 1 mg KOH/g/8 hr	28	
	Ti	Purple		100°F vis, hr to 1 cs/8 hr	45
	Ag	L yellow	Test Conditions	Sample temperature, °F	392
	Steel	Green		Sample volume, ml	200
	Cu	L etching		Air rate, liters/hr	10
	Mg	M etching		Condensate return	Yes

TEST NO. 343-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.87	-	3.69	0.04	
16 hr	14.97	+0.7	3.70	0.85	
24 hr	14.91	+0.3	3.69	1.05	
40 hr	14.75	-0.8	3.63	1.57	
48 hr	14.70	-1.1	3.58	2.79	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	-0.06	Tube deposits:	Total demerits	58
	Steel	+0.02			
	Cu	-0.04			
	Mg	-0.04			
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Breakpoint Data		
	Ti	Yellow	Neut. no., hr to 1 mg KOH/g/8 hr	43	
	Ag	Yellow	100°F vis, hr to 1 cs/8 hr	48+	
	Steel	Blue	Test Conditions		
	Cu	Green	Sample temperature, °F	392	
	Mg	L yellow	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 343-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.26	—	3.21	0.05	
16 hr	14.02	5.7	3.34	0.63	
24 hr	14.19	7.0	3.37	0.86	
40 hr	14.48	9.2	3.41	1.19	
48 hr	14.59	10.0	3.43	1.37	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	-0.04		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	0
	Steel	0.00		Breakpoint Data	
	Cu	-0.02		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	0.00		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	392	
	Ag	No change	Sample volume, ml	200	
	Steel	Blue-green	Air rate, liters/hr	10	
	Cu	Yellow	Condensate return	Yes	
	Mg	No change			

TEST NO. 343-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.63	—	3.30	0.22	
16 hr	14.30	4.9	3.38	0.52	
24 hr	14.47	6.2	3.42	0.70	
40 hr	14.73	8.1	3.45	0.89	
48 hr	14.84	8.9	3.47	1.11	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.04		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	16
	Steel	-0.02		Breakpoint Data	
	Cu	-0.06		Neut. no., hr to 1 mg KOH/g/8 hr	43+
	Mg	0.00		100°F vis, hr to 1 cs/8 hr	43+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	L yellow	Sample temperature, °F	392	
	Ag	Gray	Sample volume, ml	200	
	Steel	Blue-green	Air rate, liters/hr	10	
	Cu	Brown	Condensate return	Yes	
	Mg	No change			

TEST NO. 343-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.04	—	3.47	0.24	
16 hr	13.18	1.1	3.46	1.94	
24 hr	13.20	1.2	3.45	2.17	
40 hr	13.25	1.6	3.44	3.01	
48 hr	14.07	7.9	3.51	10.12	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	-0.10		Centrifuge, vol %	None
	Ag	-0.06	Tube deposits:	Total demerits	0
	Steel	-0.04			
	Cu	-0.10			
	Mg	-0.24			
Metal discoloration, deposits, pitting, or etching:			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr		39
			100°F vis, hr to 1 cs/8 hr		46
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	No change	Sample volume, ml	200	
Ag	Gray	Air rate, liters/hr	10		
Steel	Brown	Condensate return	Yes		
Cu	Black				
Mg	H etching & L pitting				

TEST NO. 343-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.29	—	3.21	0.00	3
16 hr	13.99	5.3	3.34	0.29	
24 hr	14.21	6.9	3.36	0.50	
40 hr	14.41	8.4	3.40	0.71	
48 hr	14.52	9.3	3.41	0.85	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	-0.08		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	8
	Steel	-0.02			
	Cu	-0.02			
	Mg	-0.02			
			Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	L yellow	Sample temperature, °F	392	
	Ti	L green	Sample volume, ml	200	
	Ag	L yellow	Air rate, liters/hr	10	
	Steel	Blue-green	Condensate return	Yes	
	Cu	Orange & green			
	Mg	No change			

TEST NO. 344-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-841 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.44	—	3.22	0.18	
16 hr	13.16	5.8	3.33	1.72	
24 hr	13.35	7.3	3.37	2.40	
40 hr	13.67	9.9	3.42	3.79	
48 hr	13.81	11.0	3.44	3.18	4

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	0.00	Tube deposits:	Total demerits	43
	Steel	0.00			
	Cu	+0.06			
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	24	
	Ag	L yellow	100°F vis, hr to 1 cs/8 hr	48+	
	Steel	Purple	Test Conditions		
	Cu	Gold	Sample temperature, °F	401	
	Mg	No change	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 344-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-842 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.47	—	3.22	0.08	
16 hr	13.14	5.4	3.33	1.59	
24 hr	13.36	7.1	3.37	2.47	
40 hr	13.68	9.7	3.42	3.41	
8 hr	13.74	10.2	3.43	4.17	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	+0.02	Tube deposits:	Total demerits	21
	Steel	0.00			
	Cu	+0.02			
	Mg	-0.1			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Purple	Sample temperature, °F	401	
	Cu	Gold	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 344-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-843 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.47	—	3.22	0.08	
16 hr	13.13	5.3	3.33	1.66	
24 hr	13.36	7.1	3.37	2.60	
40 hr	13.75	10.3	3.42	3.66	
48 hr	13.78	10.5	3.44	4.09	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.02		Centrifuge, vol %	Trace
	Ag	0.00	Tube deposits:	Total demerits	29
	Steel	0.00			
	Cu	+0.04			
	Mg	-0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Blue & yellow	Sample temperature, °F	401	
	Cu	Gold	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 345-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.12	—	3.19	0.20	4
16 hr	12.91	6.5	3.31	1.84	
24 hr	13.01	7.3	3.32	2.65	
40 hr	14.07	16.1	3.48	10.06	
48 hr	15.95	31.6	3.78	16.84	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.20	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.32		Centrifuge, vol %	None
	Ag	+0.26	Tube deposits:	Total demerits	396
	Steel	+0.24			
	Cu	-0.36			
	Mg	+0.22	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	Black deposit	Neut. no., hr to 1 mg KOH/g/8 hr	22	
	Ti	Black deposit		100°F vis, hr to 1 cs/8 hr	36
	Ag	Black deposit	Test Conditions		
	Steel	Black deposit	Sample temperature, °F	401	
	Cu	1 pitting	Sample volume, ml	200	
	Mg	Black deposit	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 345-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.77	—	3.13	0.24	
16 hr	13.66	7.0	3.27	0.92	
24 hr	13.83	8.3	3.30	1.19	
40 hr	14.10	10.4	3.34	1.55	
48 hr	14.23	11.4	3.36	2.02	1
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	None
	Ag	-0.04	Tube deposits:	Total demerits	8
	Steel	+0.04			
	Cu	+0.12			
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Green	Sample temperature, °F	401	
	Cu	Orange	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 345-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34		4.58	0.26	
16 hr	16.29	6.1	4.25	1.64	
24 hr	15.60	10.0	3.88	7.92	
40 hr	21.27	+22.7	4.93	17.26	
48 hr	132.3	+663	25.50	20.2	8

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.04		Centrifuge, vol %	Trace
	Ag	-0.04	Tube deposits:	Total demerits	191
	Steel	+0.04			
	Cu	1.52			
	Mg	41.9	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching			Neut. no., hr to 1 mg KOH/g/8 hr		12
			100°F vis, hr to 1 cs/8 hr		32
			Test Conditions		
	Al	L. brown	Sample temperature, °F	401	
	Ti	Tan	Sample volume, ml	200	
Ag	Yellow	Air rate, liters/hr	10		
Steel	Green	Condensate return	Yes		
Cu	L & M pitting				
Mg	H etching				

TEST NO. 345-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	14.87	—	3.69	0.04	
16 hr	14.89	+0.1	3.67	1.12	
24 hr	14.81	-0.4	3.64	1.41	
40 hr	15.55	+4.6	3.67	7.49	
48 hr	17.29	+16.3	3.94	12.21	4

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	Trace
	Ag	-0.04	Tube deposits:	Total demerits	64
	Steel	0.00			
	Cu	-0.32			
	Mg	-0.04	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	28	
				100°F vis. hr to 1 cs/8 hr	45
	Al	L brown	Test Conditions		
	Ti	Gold	Sample temperature, °F	401	
	Ag	Yellow	Sample volume, ml	200	
Steel	Blue-green	Air rate, liters/hr	10		
Cu	L pitting	Condensate return	Yes		
Mg	L brown				

TEST NO. 345-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.25	—	3.24	0.06	3
16 hr	14.17	6.9	3.36	0.92	
24 hr	14.39	8.6	3.40	1.19	
40 hr	14.82	11.8	3.46	1.80	
48 hr	15.89	19.9	3.60	4.38	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.06	Tube deposits:	Total demerits	2
	Steel	+0.02			
	Cu	-0.04			
	Mg	0.00	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	40	
	Ti	No change		100°F vis. hr to 1 cs/8 hr	43
	Ag	No change	Test Conditions		
	Steel	L green	Sample temperature, °F	401	
		Cu	Gold	Sample volume, ml	200
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 345-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.48	-	3.25	0.21	
16 hr	14.42	7.0	3.40	0.74	
24 hr	14.63	8.5	3.44	0.90	
40 hr	15.03	11.5	3.50	1.31	
48 hr	15.23	13.0	3.53	1.75	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :			Sludge in oil: 200-mesh filter Trace		
			Centrifuge, vol. % Trace		
			Tube deposits: Total demerits 26		
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr 48+		
			100°F vis, hr to 1 cs/8 hr 48+		
			Test Conditions		
			Sample temperature, °F 401		
			Sample volume, ml 200		
			Air rate, liters/hr 10		
			Condensate return Yes		

TEST NO. 345-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.04	-	3.47	0.24	
16 hr	13.29	1.9	3.46	2.93	
24 hr	13.34	2.3	3.46	3.57	
40 hr	15.51	18.0	3.73	14.66	
48 hr	17.94	37.6	4.09	25.3	6
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :			Sludge in oil: 200-mesh filter None		
			Centrifuge, vol. % Trace		
			Tube deposits: Total demerits 3		
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr 11		
			100°F vis, hr to 1 cs/8 hr 32		
			Test Conditions		
			Sample temperature, °F 401		
			Sample volume, ml 200		
			Air rate, liters/hr 10		
			Condensate return Yes		

TEST NO. 345-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.29	—	3.21	0.00	
16 hr	14.16	6.5	3.35	0.55	
24 hr	14.37	8.1	3.38	0.74	
40 hr	14.67	10.4	3.43	1.08	
48 hr	14.81	11.4	3.44	1.45	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.06	Tube deposits:	Total demerits	19
	Steel	+0.02			
	Cu	-0.04			
	Mg	+0.02			
Breakpoint Data					
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	No change	100°F vis, hr to 1 cs/8 hr		48+
	Ag	No change	Test Conditions		
	Steel	Gold	Sample temperature, °F	401	
	Cu	Orange	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 346-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-839 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.66	—	3.34	0.23	
16 hr	13.91	1.8	3.32	0.38	
24 hr	14.07	3.0	3.35	0.57	
40 hr	14.35	5.1	3.39	0.94	
48 hr	14.45	5.8	3.41	1.08	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	None
	Ti	+0.18		Centrifuge, vol %	None
	Ag	+0.08	Tube deposits:	Total demerits	0
	Steel	+0.02			
	Cu	+0.08			
	Mg	+0.04			
Breakpoint Data					
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	No change	100°F vis, hr to 1 cs/8 hr		48+
	Ag	No change	Test Conditions		
	Steel	Blue-green	Sample temperature, °F	385	
	Cu	Yellow	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 346-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-840 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.29	—	3.22	0.08	
16 hr	14.69	10.5	3.52	1.02	
24 hr	14.86	11.8	3.55	1.16	
40 hr	15.15	14.0	3.60	1.36	
48 hr	15.25	14.7	3.62	1.63	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.12	Sludge in oil:	200-mesh filter	None
	Ti	+0.10		Centrifuge, vol %	None
	Ag	+0.12	Tube deposits:	Total demerits	2
	Steel	+0.08		Breakpoint Data	
	Cu	-0.18		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	+0.10		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	385	
	Ag	No change	Sample volume, ml	200	
	Steel	Purple	Air rate, liters/hr	10	
	Cu	Blue & yellow	Condensate return	Yes	
	Mg	Gray			

TEST NO. 347-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-840 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.29	—	3.22	0.08	
16 hr	14.04	5.6	3.34	0.68	
24 hr	14.21	6.9	3.37	0.84	
40 hr	14.46	8.8	3.41	1.20	
48 hr	14.57	9.6	3.43	1.49	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	-0.06		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	1
	Steel	-0.02		Breakpoint Data	
	Cu	+0.02		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	+0.06		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	392	
	Ag	L yellow	Sample volume, ml	200	
	Steel	Blue-green	Air rate, liters/hr	10	
	Cu	Yellow	Condensate return	Yes	
	Mg	No change			

TEST NO. 347-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-850 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.19	—	3.54	0.11	2
16 hr	15.72	3.5	3.62	0.44	
24 hr	15.94	4.9	3.66	0.58	
40 hr	16.17	6.5	3.70	0.75	
48 hr	16.33	7.5	3.72	0.98	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.10	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.06		Centrifuge, vol %	Trace
	Ag	-0.02	Tube deposits:	Total demerits	46
	Steel	-0.02			
	Cu	-0.06			
	Mg	+0.02			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions	Sample temperature, °F	392
	Steel	Blue-green		Sample volume, ml	200
	Cu	Orange		Air rate, liters/hr	10
	Mg	Gray		Condensate return	Yes

TEST NO. 347-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-851 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.43	—	3.60	0.13	2
16 hr	15.96	3.4	3.67	0.50	
24 hr	16.14	4.6	3.71	0.49	
40 hr	16.45	6.6	3.76	0.77	
48 hr	16.63	7.8	3.80	1.00	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.02		Centrifuge, vol %	0.8
	Ag	0.00	Tube deposits:	Total demerits	34
	Steel	-0.04			
	Cu	+0.02			
	Mg	+0.08	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	No change	Test Conditions		
	Steel	Blue-green	Sample temperature, °F	392	
	Cu	Orange	Sample volume, ml	200	
	Mg	L brown	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 347-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-852 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	16.75	—	3.81	0.10	4
16 hr	17.30	3.3	3.91	0.49	
24 hr	17.59	5.0	3.92	0.63	
40 hr	17.76	6.0	3.94	0.90	
48 hr	18.05	7.8	3.98	1.12	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	−0.08		Centrifuge, vol %	0.4
	Ag	−0.04	Tube deposits:	Total demerits	37
	Steel	0.00			
	Cu	−0.06			
	Mg	0.00	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Brown	Test Conditions		
	Steel	Blue-green	Sample temperature, °F	392	
	Cu	Gold	Sample volume, ml	200	
	Mg	Yellow	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 347-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-853 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	16.18	—	3.70	0.21	3
16 hr	16.73	3.4	3.78	0.74	
24 hr	16.94	4.7	3.83	0.94	
40 hr	17.48	8.0	3.90	1.80	
48 hr	20.76	28.3	4.32	7.21	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	Trace
	Ag	0.00	Tube deposits:	Total demerits	34
	Steel	+0.08			
	Cu	−0.24			
	Mg	+0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		40
	Ti	L brown	100°F vis, hr to 1 cs/8 hr		41
	Ag	L yellow	Test Conditions		
	Steel	Blue-green	Sample temperature, °F	392	
	Cu	L pitting	Sample volume, ml	200	
	Mg	L yellow	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 347-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-854 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.69	—	3.33	0.13	
16 hr	14.40	5.2	3.45	0.47	
24 hr	14.83	8.3	3.48	0.65	
40 hr	14.99	9.5	3.51	0.82	
48 hr	15.14	10.6	3.52	0.95	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.04		Centrifuge, vol %	Trace
	Ag	+0.08	Tube deposits:	Total demerits	51
	Steel	+0.16		Breakpoint Data	
	Cu	+0.06		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	+0.18		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	392	
	Ag	L yellow	Sample volume, ml	200	
	Steel	Dark blue	Air rate, liters/hr	10	
	Cu	Brown	Condensate return	Yes	
	Mg	L yellow			

TEST NO. 347-7, RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-859 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.46	—	3.40	0.57	
16 hr	15.16	12.6	3.68	3.82	
24 hr	17.11	27.1	3.94	9.44	
40 hr	21.17	57.3	4.60	18.30	
48 hr	24.15	79.4	5.02	22.4	6
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.04		Centrifuge, vol %	1.2
	Ag	+0.04	Tube deposits:	Total demerits	154
	Steel	+0.10		Breakpoint Data	
	Cu	-1.08		Neut. no., hr to 1 mg KOH/g/8 hr	7
	Mg	-1.52		100°F vis, hr to 1 cs/8 hr	11
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	L brown	Sample temperature, °F	392	
	Ag	L yellow	Sample volume, ml	200	
	Steel	Blue	Air rate, liters/hr	10	
	Cu	L pitting & M etching	Condensate return	Yes	
	Mg	H pitting			

TEST NO. 347-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-7 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.69		3.38	0.08	
16 hr	14.44	5.5	3.50	0.85	
24 hr	14.65	7.0	3.54	1.25	
40 hr	14.91	8.9	3.59	1.92	
48 hr	15.06	10.0	3.61	2.22	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	2
	Steel	+0.12			
	Cu	+0.12			
	Mg	+0.10			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Blue-green			
	Cu	Gold			
	Mg	No change			
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 348-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	12.12	-	3.19	0.20	
16 hr	13.20	8.9	3.37	5.03	
24 hr	14.41	18.9	3.56	10.48	
40 hr	20.23	66.9	4.80	20.8	
48 hr	44.74	269	8.91	25.7	8
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.22	Sludge in oil:	200-mesh filter	7.2 g
	Ti	+0.28		Centrifuge, vol %	24
	Ag	+0.22	Tube deposits:	Total demerits	365
	Steel	+0.30			
	Cu	-0.60			
	Mg	-1.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	3	
			100°F vis, hr to 1 cs/8 hr	18	
			Test Conditions		
	Al	Brown deposit	Sample temperature, °F	419	
	Ti	Brown deposit	Sample volume, ml	200	
Ag	Brown deposit	Air rate, liters/hr	10		
Steel	Gray deposit	Condensate return	Yes		
Cu	L pitting				
Mg	M pitting				

TEST NO. 348-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.77	—	3.13	0.24	4
16 hr	13.95	9.2	3.31	1.37	
24 hr	14.23	11.4	3.35	1.82	
40 hr	17.23	34.9	3.79	7.31	
48 hr	19.37	51.7	4.13	10.82	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	-0.02		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	7
	Steel	0.00			
	Cu	+0.16			
	Mg	-0.92			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	26	
	Ag	L brown	100°F vis, hr to 1 cs/8 hr	29	
	Steel	L green	Test Conditions		
	Cu	Orange	Sample temperature, °F	419	
	Mg	L pitting	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 348-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34	—	4.58	0.26	10
16 hr	15.57	-10.2	3.88	4.43	
24 hr	17.98	+3.7	4.33	12.89	
40 hr	383.1	+1209	53.12	18.92	
48 hr	1219	+6930	74.58	21.6	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	20
	Ag	0.00	Tube deposits:	Total demerits	260
	Steel	0.00			
	Cu	-1.28			
	Mg	-56.2			
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Breakpoint Data		
	Ti	Brown	Neut. no., hr to 1 mg KOH/g/8 hr	5	
	Ag	L yellow	100°F vis, hr to 1 cs/8 hr	17	
	Steel	Green	Test Conditions		
	Cu	L pitting & etching	Sample temperature, °F	419	
	Mg	90% destroyed	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 348-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.87	—	3.69	0.04	6
16 hr	14.67	-1.3	3.60	3.83	
24 hr	15.46	+4.0	3.65	7.11	
40 hr	19.58	+31.7	4.31	15.46	
48 hr	22.32	+50.1	4.75	18.91	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	-0.02		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	104
	Steel	0.00			
	Cu	-0.82			
	Mg	-0.14	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	6	
			100°F vis, hr to 1 cs/8 hr	28	
			Tes. Conditions		
	Al	L brown	Sample temperature, °F	419	
	Ti	Blue	Sample volume, ml	200	
Ag	Brown	Air rate, liters/hr	10		
Steel	Green	Condensate return	Yes		
Cu	L pitting				
Mg	Brown				

TEST NO. 348-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.25	—	3.24	0.06	7
16 hr	14.59	10.1	3.42	1.81	
24 hr	15.79	19.2	3.59	4.29	
40 hr	20.94	58.0	4.28	9.71	
48 hr	24.04	81.4	4.71	11.91	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	3
	Steel	+0.02			
	Cu	0.00			
	Mg	-0.76	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	10	
			100°F vis, hr to 1 cs/8 hr	30	
			Test Conditions		
	Al	No change	Sample temperature, °F	419	
	Ti	No change	Sample volume, ml	200	
Ag	L brown	Air rate, liters/hr	10		
Steel	Pink	Condensate return	Yes		
Cu	Gold				
Mg	L pitting				

TEST NO. 348-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.48	—	3.25	0.21	
16 hr	14.79	9.7	3.46	1.32	
24 hr	15.23	13.0	3.53	1.89	
40 hr	18.16	34.7	3.94	7.23	
48 hr	20.66	53.3	4.31	11.19	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil: 200-mesh filter		Trace
	Ti	+0.02	Centrifuge, vol %		None
	Ag	+0.04			
	Steel	+0.02	Tube deposits: Total demerits		17
	Cu	-0.24			
	Mg	-0.96			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	L brown	Neut. no., hr to 1 mg KOH/g/8 hr		29
	Ag	L yellow	100°F vis, hr to 1 cs/8 hr		29
	Steel	Blue-green	Test Conditions		
	Cu	L etching	Sample temperature, °F		419
	Mg	M pitting	Sample volume, ml		200
			Air rate, liters/hr		10
			Condensate return		Yes

TEST NO. 348-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.04	—	3.47	0.24	
16 hr	13.59	4.2	3.46	6.88	
24 hr	15.31	17.4	3.70	15.45	
40 hr	21.14	62.1	4.61	31.2	
48 hr	28.05	115	5.73	37.8	11
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil: 200-mesh filter		Trace
	Ti	+0.02	Centrifuge, vol %		Trace
	Ag	0.00			
	Steel	0.00	Tube deposits: Total demerits		20
	Cu	-0.66			
	Mg	-6.14			
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr		< 8
	Ag	Gray	100°F vis, hr to 1 cs/8 hr		16
	Steel	Blue-green	Test Conditions		
	Cu	L pitting	Sample temperature, °F		419
	Mg	H pitting & M etching	Sample volume, ml		200
			Air rate, liters/hr		10
			Condensate return		Yes

TEST NO. 348-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.29	—	3.21	0.00	5
16 hr	14.49	9.0	3.39	1.02	
24 hr	14.83	11.6	3.45	1.48	
40 hr	16.46	23.9	3.68	4.42	
48 hr	18.38	38.3	3.98	9.07	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	6
	Steel	0.00			
	Cu	-0.40			
	Mg	-0.50	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		32
			100°F vis, hr to 1 cs/8 hr		35
	Test Conditions				
			Sample temperature, °F	419	
			Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 349-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1082^(a) AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.20	—	3.86	0.23	3
16 hr	15.09	-0.7	3.77	0.57	
24 hr	15.15	-0.3	3.89	0.70	
40 hr	15.08	-0.8	3.74	1.14	
48 hr	15.92	+4.7	3.76	6.64	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	-0.02	Tube deposits:	Total demerits	28
	Steel	-0.02			
	Cu	-0.02			
	Mg	-0.06			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	39	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	46
	Ag	L brown	Test Conditions		
	Steel	Blue			
	Cu	Orange	Sample temperature, °F	385	
	Mg	No change	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		
(A) Blend (1:1) of O-67-7 and O-67-20.					

TEST NO. 349-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-868 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.93	—	3.46	0.26	
16 hr	13.04	0.9	3.45	1.53	
24 hr	13.07	1.1	3.46	1.77	
40 hr	13.15	1.7	3.44	2.27	
48 hr	13.15	1.7	3.43	2.51	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :			Sludge in oil: 200-mesh filter None		
			Centrifuge, vol % None		
			Tube deposits: Total demerits 2		
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr 43+		
			100°F vis, hr to 1 cs/8 hr 48+		
			Test Conditions		
			Sample temperature, °F 385		
			Sample volume, ml 200		
			Air rate, liters/hr 10		
			Condensate return Yes		

TEST NO. 349-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1103^(a) AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.09	—	3.48	0.20	
16 hr	14.57	3.4	3.53	0.47	
24 hr	14.69	4.3	3.55	0.60	
40 hr	14.79	5.0	3.55	0.76	
48 hr	14.82	5.2	3.56	1.00	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :			Sludge in oil: 200-mesh filter Trace		
			Centrifuge, vol % None		
			Tube deposits: Total demerits 26		
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr 48+		
			100°F vis, hr to 1 cs/8 hr 48+		
			Test Conditions		
			Sample temperature, °F 385		
			Sample volume, ml 200		
			Air rate, liters/hr 10		
			Condensate return Yes		

(a) Blend (4:1) of O-67-20 and O-67-7.

TEST NO. 350-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	17.34	—	4.58	0.26	
7 days	16.89	-2.6	4.43	1.14	
14 days	15.86	-8.5	4.17	2.56	
21 days	26.01	+50.0	5.68	34.8	
26 days	(a)	—	(a)	44.9	14
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	(a)
	Ti	+0.12		Centrifuge, vol %	72
	Ag	-0.02	Tube deposits:	Total demerits	387
	Steel	+0.06		Breakpoint Data	
	Cu	-3.18		Neut. no., days to 1 mg KOH/g/4 days	15
	Mg	-1.22		100°F vis, days to 1 cs/4 days	19
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Test Conditions		
	Ti	Yellow	Sample temperature, °F	347	
	Ag	Brown		Sample volume, ml	
	Steel	Purple		Air rate, liters/hr	
	Cu	L etching		Condensate return	
	Mg	H pitting			
(a) Semisolid—analysis not possible.					

TEST NO. 350-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34	—	4.58	0.26	
7 days	16.87	-2.7	4.44	1.14	
14 days	15.97	-7.9	4.18	2.26	
21 days	25.36	+46.3	4.86	29.2	
26 days	(a)	—	(a)	51.4	12

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	(a)
	Ti	+0.12		Centrifuge, vol %	68
	Ag	-0.02	Tube deposits:	Total demerits	365
	Steel	+0.06		Breakpoint Data	
	Cu	-2.76		Neut. no., days to 1 mg KOH/g/4 days	15
	Mg	-0.58		100°F vis, days to 1 cs/4 days	16
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Test Conditions		
	Ti	Yellow	Sample temperature, °F	347	
	Ag	L brown		Sample volume, ml	
	Steel	Purple		Air rate, liters/hr	
	Cu	L pitting & L etching		Condensate return	
	Mg	M pitting			

(a) Semisolid—analysis not possible.

TEST NO. 350-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.87	—	3.69	0.04	6
7 days	15.14	1.8	3.73	0.89	
14 days	14.98	0.7	3.69	1.28	
21 days	15.16	2.0	3.70	1.69	
26 days	15.21	2.3	3.71	1.84	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.10		Centrifuge, vol %	None
	Ag	-0.10	Tube deposits:	Total demerits	66
	Steel	+0.06			
	Cu	-0.18			
	Mg	+0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., days to 1 mg KOH/g/4 days		26+
			100°F vis, days to 1 cs/4 days		26+
			Test Conditions		
	Al	No change	Sample temperature, °F	347	
	Ti	Blue	Sample volume, ml	200	
Ag	L purple	Air rate, liters/hr	10		
Steel	Blue-green	Condensate return	Yes		
Cu	Brown				
Mg	No change				

TEST NO. 350-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.87	—	3.69	0.04	4
7 days	15.12	1.7	3.74	0.83	
14 days	15.02	1.0	3.69	1.22	
21 days	15.11	1.6	3.68	1.86	
26 days	15.22	2.4	3.70	2.11	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	-0.08	Tube deposits:	Total demerits	70
	Steel	-0.02			
	Cu	-0.18			
	Mg	0.00	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., days to 1 mg KOH/g/4 days	26+	
	Ti	Blue		100°F vis, days to 1 cs/4 days	26+
	Ag	L purple	Test Conditions		
	Steel	Blue-green	Sample temperature, °F	347	
	Cu	Brown	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 350-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.04	—	3.47	0.24	
7 days	13.29	1.9	3.48	1.68	
14 days	13.28	1.8	3.43	3.37	
21 days	27.51	111	5.44	45.7	
26 days	125.9	865	20.32	59.1	26
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil:	200-mesh filter	(a)
	Ti	−0.02		Centrifuge, vol %	24
	Ag	−0.20	Tube deposits:	Total demerits	428
	Steel	−0.04			
	Cu	−4.86			
	Mg	−1.38			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., days to 1 mg KOH/g/4 days	11	
	Ag	L pitting	100°F vis, days to 1 cs/4 days	16	
	Steel	No change	Test Conditions		
	Cu	L pitting & M etching	Sample temperature, °F	347	
	Mg	M pitting	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Sample would not pass filter.					

TEST NO. 350-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	13.04	—	3.47	0.24		
7 days	13.29	1.9	3.47	1.64		
14 days	13.35	2.4	3.43	4.19		
21 days	39.73	205	7.00	60.6		
26 days	40.48	210	8.84	50.9	26	
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	−0.06	Sludge in oil: 200-mesh filter (a)	Centrifuge, vol % 16		
	Ti	+0.06				
	Ag	−0.20	Tube deposits: Total demerits 419			
	Steel	0.00				
	Cu	−5.06				
	Mg	+0.04				
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., days to 1 mg KOH/g/4 days 10		100°F vis, days to 1 cs/4 days 16	
	Ti	No change				
	Ag	L pitting	Test Conditions			
	Steel	No change				
	Cu	L pitting & M etching	Sample temperature, °F 347			
	Mg	L yellow				
			Sample volume, ml 200			
			Air rate, liters/hr 10			
			Condensate return Yes			
(a) Sample would not pass filter.						

TEST NO. 351-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1082^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.20	—	3.85	0.23	
16 hr	15.10	-0.7	3.77	0.67	
24 hr	15.14	-0.4	3.76	0.85	
40 hr	16.52	+8.7	3.85	7.49	
48 hr	18.68	+22.9	4.18	13.33	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	-0.06	Tube deposits:	Total demerits	24
	Steel	0.00			
	Cu	-0.28			
	Mg	-0.12			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	31	
	Ag	L yellow	100°F vis, hr to 1 cs/8 hr	36	
	Steel	Blue	Test Conditions		
	Cu	L etching	Sample temperature, °F	392	
	Mg	No change	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-7 and O-67-20.					

TEST NO. 351-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-868 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.93	—	3.46	0.26	3
16 hr	13.00	0.5	3.43	1.32	
24 hr	13.03	0.8	3.44	1.75	
40 hr	13.10	1.3	3.43	2.34	
48 hr	13.16	1.8	3.42	2.92	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	-0.02		Centrifuge, vol %	None
	Ag	-0.06	Tube deposits:	Total demerits	2
	Steel	-0.04			
	Cu	-0.04			
	Mg	+0.16			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Gray	Test Conditions	Sample temperature, °F	392
	Steel	L purple		Sample volume, ml	200
	Cu	Black		Air rate, liters/hr	10
	Mg	L blue		Condensate return	Yes

TEST NO. 351-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1103^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.09	—	3.48	0.20	2
16 hr	14.62	3.8	3.54	0.52	
24 hr	14.73	4.5	3.54	0.71	
40 hr	14.85	5.4	3.55	1.03	
48 hr	14.93	6.0	3.57	1.25	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.02		Centrifuge, vol %	None
	Ag	-0.06	Tube deposits:	Total demerits	34
	Steel	0.00			
	Cu	-0.10			
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ag	L yellow	100°F vis, hr to 1 cs/8 hr	48+	
	Steel	Blue	Test Conditions		
	Cu	L green	Sample temperature, °F	392	
	Mg	No change	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (4:1) of O-67-20 and O-67-7.					

TEST NO. 352-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON Q-60-18 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.12	—	3.19	0.20	3
16 hr	12.81	5.7	3.30	0.82	
24 hr	12.96	6.9	3.36	0.99	
40 hr	12.94	6.8	3.33	1.31	
48 hr	12.66	4.5	3.26	1.44	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.04		Centrifuge, vol %	Trace
	Ag	+0.16	Tube deposits:	Total demerits	260
	Steel	−0.02			
	Cu	0.00			
	Mg	+0.08	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	L yellow		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Purple	Sample temperature, °F	374	
	Cu	Brown	Sample volume, ml	200	
	Mg	Brown	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 352-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.77	—	3.13	0.24	
16 hr	13.28	4.0	3.21	0.48	
24 hr	13.52	5.9	3.23	0.56	
40 hr	13.67	7.0	3.27	0.75	
48 hr	13.72	7.4	3.28	0.92	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	2
	Steel	+0.04			
	Cu	+0.14			
	Mg	+0.74	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	No change	100°F vis, hr to 1 cs/8 hr		48+
	Ag	L yellow	Test Conditions		
	Steel	Green	Sample temperature, °F	374	
	Cu	Gold	Sample volume, ml	200	
	Mg	Brown deposit	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 352-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.1	—	4.58	0.26	
16 hr	17.1	-1.2	4.51	0.65	
24 hr	17.1	-1.4	4.49	0.83	
40 hr		-2.2	4.45	0.96	
48 hr		-2.9	4.41	1.22	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	49
	Steel	+0.04			
	Cu	+0.02			
	Mg	+0.24	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	L yellow	100°F vis, hr to 1 cs/8 hr		48+
	Ag	L yellow	Test Conditions		
	Steel	Blue	Sample temperature, °F	374	
	Cu	Yellow	Sample volume, ml	200	
	Mg	Brown deposit	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 352-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.87	—	3.69	0.04	3
16 hr	15.04	1.1	3.73	0.54	
24 hr	15.09	1.5	3.74	0.66	
40 hr	15.03	1.1	3.71	0.88	
48 hr	15.02	1.0	3.71	0.99	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.10		Centrifuge, vol %	None
	Ag	+0.06	Tube deposits:	Total demerits	13
	Steel	0.00		Breakpoint Data	
	Cu	-0.10		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	+0.20		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Test Conditions		
	Ti	Brown	Sample temperature, °F	374	
	Ag	L yellow		Sample volume, ml	
	Steel	Blue		Air rate, liters/hr	
	Cu	Brown		Condensate return	
	Mg	Black deposit		Yes	

TEST NO. 352-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.26	—	3.21	0.05	3
16 hr	13.77	3.2	3.30	0.25	
24 hr	13.89	4.8	3.33	0.20	
40 hr	14.09	6.3	3.36	0.64	
48 hr	14.23	7.3	3.38	0.75	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	0
	Steel	−0.04		Breakpoint Data	
	Cu	−0.02		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	+0.04		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	374	
	Ag	L yellow		Sample volume, ml	
	Steel	Blue		Air rate, liters/hr	
	Cu	Yellow		Condensate return	
	Mg	No change		Yes	

TEST NO. 352-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.48	—	3.25	0.21	4
16 hr	14.09	4.5	3.36	0.31	
24 hr	14.25	5.7	3.38	0.39	
40 hr	14.45	7.2	3.42	0.53	
48 hr	14.54	7.9	3.43	0.64	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	1
	Steel	−0.08		Breakpoint Data	
	Cu	+0.06		Neut. no., hr to 1 mg KOH/g/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Mg	+0.10	100°F vis, hr to 1 cs/8 hr		48+
	Al	L yellow	Test Conditions		
	Ti	Brown	Sample temperature, °F	374	
	Ag	Brown	Sample volume, ml	200	
	Steel	Green	Air rate, liters/hr	10	
Cu	Brown	Condensate return	Yes		
Mg	L yellow				

TEST NO. 352-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.04	—	3.47	0.24	3
16 hr	13.14	0.8	3.49	0.92	
24 hr	13.10	0.5	3.47	1.05	
40 hr	13.17	1.0	3.43	1.41	
48 hr	13.19	1.2	3.46	1.63	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil:	200-mesh filter	None
	Ti	−0.02		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	1
	Steel	−0.04			
	Cu	+0.02			
	Mg	+0.08			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Yellow	Test Conditions		
	Steel	No change	Sample temperature, °F	374	
	Cu	No change	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 352-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.29	—	3.21	0.00	
16 hr	13.80	3.8	3.30	0.11	
24 hr	13.86	4.3	3.31	0.21	
40 hr	14.15	6.5	3.34	0.42	
48 hr	14.26	7.3	3.37	0.48	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² : Al -0.10 Ti 0.00 Ag -0.12 Steel -0.04 Cu 0.00 Mg +0.10 Metal discoloration, deposits, pitting, or etching: Al L yellow Ti Brown Ag L yellow Steel L purple Cu Gold Mg No change			Sludge in oil: 200-mesh filter None Centrifuge, vol % None		
			Tube deposits: Total demerits 0		
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr 48+ 100°F vis, hr to 1 cs/8 hr 48+		
			Test Conditions		
			Sample temperature, °F 374 Sample volume, ml 200 Air rate, liters/hr 10 Condensate return Yes		

TEST NO. 353-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON L-1136A^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	16.08	—	4.13	0.15	4	
16 hr	15.74	-2.1	4.02	0.94		
24 hr	15.60	-3.0	3.97	1.19		
40 hr	15.38	-4.4	3.74	7.91		
48 hr	17.44	+8.5	4.06	14.95		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	None	
	Ti	-0.02		Centrifuge, vol %	None	
	Ag	-0.10		Tube deposits:	Total demerits	48
	Steel	+0.02				
	Cu	-0.28				
	Mg	-0.82	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Neut. no., hr to 1 mg KOH/g/8 hr	29		
	Ti	Brown		100°F vis, hr to 1 cs/8 hr	42	
	Ag	Brown	Test Conditions			
	Steel	Green	Sample temperature, °F	392		
	Cu	L pitting	Sample volume, m ^l	200		
Mg	M etching	Air rate, liters/hr	10			
		Condensate return	Yes			
(a) Blend (1:1) of O-67-7 and O-67-9.						

TEST NO. 353-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1106^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.22	—	3.85	0.17	3
16 hr	15.28	0.4	3.82	0.60	
24 hr	15.26	0.3	3.81	0.79	
40 hr	15.24	0.1	3.70	3.70	
48 hr	17.49	14.9	3.98	10.51	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	-0.04		Centrifuge, vol %	None
	Ag	-0.10	Tube deposits:	Total demerits	2
	Steel	-0.04			
	Cu	-0.14			
	Mg	-0.56			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	30	42
	Ag	L yellow			
	Steel	Blue-green	Test Conditions		
	Cu	Gold	Sample temperature, °F	392	
	Mg	L etching	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-7 and O-67-11.					

TEST NO. 353-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1107^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	15.11	—	4.00	0.25	4
16 hr	15.05	-0.4	3.93	1.13	
24 hr	14.91	-1.3	3.89	1.39	
40 hr	15.02	-0.6	3.72	10.16	
48 hr	16.72	+10.7	3.98	17.85	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	-0.04		Centrifuge, vol %	None
	Ag	-0.12	Tube deposits:	Total demerits	26
	Steel	-0.02			
	Cu	-0.34			
	Mg	-0.54			
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	28	
	Ag	Tan			
	Steel	L purple	Test Conditions		
	Cu	L pitting	Sample temperature, °F	392	
	Mg	L etching	Sample volume, ml	200	
			Air rate, liters/hr	100	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-7 and O-67-24.					

TEST NO. 353-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1108^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.16	—	3.49	0.06	2
16 hr	14.46	2.1	3.52	0.47	
24 hr	14.53	2.6	3.52	0.59	
40 hr	14.58	3.0	3.52	0.79	
48 hr	14.63	3.3	3.53	0.93	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	-0.04		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	0
	Steel	0.00			
	Cu	-0.02			
	Mg	-0.06			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ag	No change		100°F vis, hr to 1 cs/8 hr	48+
	Steel	Blue-green	Test Conditions		
	Cu	Gold	Sample temperature, °F	392	
	Mg	No change	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-9 and O-67-11.					

TEST NO. 353-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1109^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.21	—	3.49	0.12	2
16 hr	14.60	2.7	3.52	0.47	
24 hr	14.67	3.2	3.52	0.60	
40 hr	14.76	3.9	3.54	0.84	
48 hr	14.81	4.2	3.53	1.08	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	-0.06	Tube deposits:	Total demerits	73
	Steel	0.00			
	Cu	-0.18			
	Mg	-0.12			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Tan	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	Orange	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-9 and O-67-20.					

TEST NO. 353-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1110^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.96	—	3.60	0.16	
16 hr	14.08	- 0.9	3.59	0.94	
24 hr	14.08	+ 0.9	3.58	1.19	
40 hr	13.94	- 0.1	3.54	2.04	
48 hr	14.75	+ 5.7	3.59	8.35	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² : Al 0.00 Ti +0.06 Ag -0.04 Steel +0.04 Cu -0.32 Mg +0.06 Metal discoloration, deposits, pitting, or etching: Al No change Ti No change Ag Tan Steel L purple Cu L etching Mg Blue-green			Sludge in oil: 200-mesh filter	None	
			Centrifuge, vol %	None	
			Tube deposits: Total demerits	13	
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr	39	
			100°F vis, hr to 1 cs/8 hr	46	
			Test Conditions		
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-9 and O-67-24.					

TEST NO. 353-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1111^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.36	—	3.24	0.12	
16 hr	14.11	5.6	3.36	0.49	
24 hr	14.30	7.0	3.39	0.68	
40 hr	14.52	8.7	3.41	0.89	
48 hr	14.7	9.1	3.44	1.13	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² : Al -0.04 Ti +0.04 Ag -0.06 Steel +0.04 Cu -0.02 Mg +0.06 Metal discoloration, deposits, pitting, or etching: Al No change Ti No change Ag Tan Steel Green Cu Orange Mg Gray			Sludge in oil: 200-mesh filter	None	
			Centrifuge, vol %	None	
			Tube deposits: Total demerits	1	
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr	48+	
			100°F vis, hr to 1 cs/8 hr	48+	
			Test Conditions		
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-11 and O-67-20.					

TEST NO. 354-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1112^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.03	—	3.33	0.16	6
16 hr	13.49	3.5	3.40	1.18	
24 hr	13.66	4.8	3.41	1.99	
40 hr	16.76	28.6	3.82	11.47	
48 hr	19.30	48.1	4.20	16.21	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	2
	Steel	+0.04			
	Cu	−0.30			
	Mg	−1.06			
Metal discoloration, deposits, pitting, or etching:	Al	L blue	Neut no., hr to 1 mg KOH/g/8 hr	22	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	29
	Ag	Tan	Test Conditions		
	Steel	Purple		Sample temperature, °F	392
	Cu	L etching		Sample volume, ml	20
	Mg	L pitting		Air rate, liters/hr	10
			Condensate return	Yes	
(a) Blend (1:1) of O-67-11 and O-67-24.					

TEST NO. 354-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1113^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.13	—	3.34	0.22	3
16 hr	13.65	4.0	3.42	0.84	
24 hr	13.77	4.9	3.42	1.45	
40 hr	14.54	10.7	3.52	4.87	
48 hr	16.66	26.9	3.82	11.81	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	Trace
	Ag	−0.06	Tube deposits:	Total demerits	4
	Steel	+0.06			
	Cu	−0.26			
	Mg	−0.72			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	29	
	Ag	Gray		100°F vis, hr to 1 cs/8 hr	39
	Steel	Purple	Test Conditions		
	Cu	L etching	Sample temperature, °F	392	
	Mg	M pitting	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-20 and O-67-24.					

TEST NO. 355-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1082A^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.21	-	3.87	0.20	
16 hr	15.12	-0.6	3.78	0.66	
24 hr	15.11	-0.7	3.72	0.90	
40 hr	17.30	+13.7	3.94	9.37	
48 hr	19.60	+28.9	4.25	14.94	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.08	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.08		Centrifuge, vol %	0.2
	Ag	0.00	Tube deposits:	Total demerits	68
	Steel	-0.04			
	Cu	-0.22			
	Mg	-0.28			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr		29
	Ag	L brown	100°F vis, hr to 1 cs/8 hr		32
	Steel	Blue	Test Conditions		
	Cu	L etching	Sample temperature, °F	392	
	Mg	L pitting	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		
(a) Blend (1:1) of O-67-7 and O-67-20.					

TEST NO. 355-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1114^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.13	—	3.82	0.18	3
16 hr	15.14	+0.1	3.76	0.64	
24 hr	15.10	−0.2	3.74	0.84	
40 hr	15.37	+1.6	3.71	3.37	
48 hr	17.02	+12.5	3.91	9.14	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	−0.02		Centrifuge, vol %	0.4
	Ag	0.00	Tube deposits:	Total demerits	88
	Steel	+0.04			
	Cu	−0.02			
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Breakpoint Data		
	Ti	L brown	Neut. no., hr to 1 mg KOH/g/8 hr	32	
	Ag	L brown	100°F vis, hr to 1 cs/8 hr	43	
	Steel	Blue-green	Test Conditions		
	Cu	Orange	Sample temperature, °F	392	
	Mg	L yellow	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1:1) of O-67-7, O-67-9, and O-67-20.					

TEST NO. 355-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1116^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.33	—	3.55	0.19	2
15 hr	14.76	3.0	3.58	0.53	
24 hr	14.79	3.2	3.57	0.75	
40 hr	14.91	4.0	3.55	1.17	
48 hr	14.98	4.5	3.59	1.67	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil: 200-mesh filter Centrifuge, vol %	Trace None	
	Ti	0.00			
	Ag	-0.02			
	Steel	0.00			
	Cu	-0.10			
	Mg	-0.06	Tube deposits: Total demerits	-	
			Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr 100°F vis, hr to 1 cs/8 hr	48+ 48+	
	Ti	No change			
	Ag	L yellow			
	Steel	Blue			
	Cu	Brown			
	Mg	No change	Test Conditions		
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:3) of O-67-7 and O-67-20.					

TEST NO. 355-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1117^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.23	—	4.20	0.24	6
16 hr	15.74	−3.0	4.03	0.79	
24 hr	15.51	−4.4	3.96	1.11	
40 hr	17.15	+5.7	4.04	11.80	
48 hr	19.06	+17.4	4.33	17.56	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil: 200-mesh filter Centrifuge, vol %	None	Trace
	Ti	+0.04			
	Ag	−0.02		Tube deposits: Total demerits	66
	Steel	+0.04			
	Cu	−0.72			
	Mg	−0.26			
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Breakpoint Data		
	Ti	L brown	Neut. no., hr to 1 mg KOH/g/8 hr	28	
	Ag	L yellow			100°F vis, hr to 1 cs/8 hr
	Steel	Green	Test Conditions		
	Cu	L etching	Sample temperature, °F	392	
	Mg	L pitting	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (3:1) of O-67-7 and O-67-20.					

TEST NO. 356-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.12	—	3.19	0.20	5
16 hr	13.02	7.4	3.34	1.40	
24 hr	12.78	5.4	3.30	1.75	
40 hr	12.82	5.8	3.30	2.40	
48 hr	12.85	6.0	3.30	2.90	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.26	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.28		Centrifuge, vol %	0.2
	Ag	+0.24	Tube deposits:	Total demerits	283
	Steel	+0.26			
	Cu	-0.20			
Metal discoloration, deposits, pitting, or etching:	Mg	+0.30	Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr	48+	
			100°F vis, hr to 1 cs/8 hr	48+	
	Test Conditions				
			Sample temperature, °F	392	
		Sample volume, ml	200		
		Air rate, liters/hr	20		
		Condensate return	Yes		

TEST NO. 356-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.77	—	3.13	0.24	2
16 hr	13.61	6.6	3.26	0.75	
24 hr	13.77	7.8	3.29	0.95	
40 hr	14.01	9.7	3.34	1.13	
48 hr	14.11	10.5	3.33	1.27	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	+0.06	Tube deposits:	Total demerits	3
	Steel	0.00			
	Cu	+0.06			
	Mg	+0.26	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	48+	
			100°F vis, hr to 1 cs/8 hr	48+	
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	No change	Sample volume, ml	200	
Ag	L yellow	Air rate, liters/hr	20		
Steel	L green	Condensate return	Yes		
Cu	Orange				
Mg	Gray deposit				

TEST NO. 356-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34	—	4.58	0.26	8
16 hr	16.94	-2.3	4.43	1.02	
24 hr	16.66	-3.9	4.36	1.36	
40 hr	17.69	+2.0	4.15	1.66	
48 hr	21.50	+24.0	4.78	23.9	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	+0.06	Tube deposits:	Total demerits	64
	Steel	-0.04			
	Cu	-0.88			
	Mg	-18.0	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	44	
			100°F vis, hr to 1 cs/8 hr	38	
	Test Conditions				
			Sample temperature, °F	392	
			Sample volume, ml	200	
		Air rate, liters/hr	20		
		Condensate return	Yes		

TEST NO. 356-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.87	—	3.69	0.04	
16 hr	15.04	+1.1	3.70	0.93	
24 hr	14.98	+0.7	3.70	1.14	
40 hr	14.86	-0.1	3.64	1.74	
48 hr	15.71	+5.6	3.69	6.93	4

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	24
	Steel	-0.04			
	Cu	-0.02			
	Mg	+0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	41	
			100°F vis, hr to 1 cs/8 hr	46	
			Test Conditions		
	Al	L brown	Sample temperature, °F	392	
	Ti	L purple	Sample volume, ml	200	
Ag	L brown	Air rate, liters/hr	20		
Steel	Blue-green	Condensate return	Yes		
Cu	Purple-gold				
Mg	L yellow				

TEST NO. 356-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.26	—	3.21	0.05	3
16 hr	14.65	10.5	3.36	0.56	
24 hr	14.31	7.9	3.38	0.84	
40 hr	14.64	10.4	3.43	1.01	
48 hr	14.76	11.3	3.46	1.16	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil:	200-mesh filter	None
	Ti	−0.02		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	2
	Steel	−0.02			
	Cu	+0.06			
	Mg	+0.06			
Metal discoloration, deposits, pitting, or etching:			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	No change	Sample volume, ml	200	
Ag	No change	Air rate, liters/hr	20		
Steel	Blue-green	Condensate return	Yes		
Cu	Gold				
Mg	No change				

TEST NO. 356-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut No., mg KOH/g	Oil Loss, wt, %
Initial	13.48	—	3.25	0.21	4
16 hr	14.43	7.0	3.40	0.55	
24 hr	14.62	8.5	3.43	0.68	
40 hr	14.93	10.8	3.48	0.72	
48 hr	15.08	11.9	3.52	0.85	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	−0.04		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	14
	Steel	0.00			
	Cu	0.00			
	Mg	+0.04			
			Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	L brown	Sample temperature, °F	392	
	Ti	L brown	Sample volume, ml	200	
	Ag	Tan	Air rate, liters/hr	20	
	Steel	Blue-green	Condensate return	Yes	
	Cu	Brown			
	Mg	No change			

TEST NO. 356-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.04	—	3.47	0.24	
16 hr	13.19	1.2	3.46	1.56	
24 hr	13.22	1.4	3.45	1.77	
40 hr	13.22	1.4	3.44	2.56	
48 hr	13.14	0.8	3.44	4.68	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	-0.04		Centrifuge, vol %	None
	Ag	-0.04	Tube deposits:	Total demerits	1
	Steel	0.00		Breakpoint Data	
	Cu	0.04		Neut. no., hr to 1 mg KOH/g/8 hr	40
Metal discoloration, deposits, pitting, or etching:	Mg	+0.10	Test Conditions		
	Al	No change	Sample temperature, °F 392 Sample volume, ml 200 Air rate, liters/hr 20 Condensate return Yes		
	Ti	No change			
	Ag	Gray			
	Steel	L purple			
	Cu	No change			
	Mg	L blue			
			100°F vis, hr to 1 cs/8 hr 48+		

TEST NO. 356-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.29	—	3.21	0.00	
16 hr	14.16	6.5	3.34	0.39	
24 hr	14.35	8.0	3.35	0.56	
40 hr	14.49	9.0	3.40	0.66	
48 hr	14.73	10.8	3.44	0.82	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.02		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	0
	Steel	0.00		Breakpoint Data	
	Cu	0.00		Neut. no., hr to 1 mg KOH/g/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Mg	0.00	Test Conditions		
	Al	No change	Sample temperature, °F 392 Sample volume, ml 200 Air rate, liters/hr 20 Condensate return Yes		
	Ti	L brown			
	Ag	L yellow			
	Steel	Purple-gold			
	Cu	Orange			
	Mg	No change			
			100°F vis, hr to 1 cs/8 hr 48+		

TEST NO. 357-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-877 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.01	—	3.37	0.15	4
16 hr	14.71	5.0	3.49	0.35	
24 hr	14.96	6.8	3.52	0.50	
40 hr	15.08	7.6	3.54	0.76	
48 hr	15.24	8.8	3.56	0.91	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	−0.02		Centrifuge, vol %	0.4
	Ag	0.00	Tube deposits:	Total demerits	41
	Steel	0.00			
	Cu	−0.04			
	Mg	−0.02			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	No change	Test Conditions		
	Steel	Blue		Sample temperature, °F	392
	Cu	Pink		Sample volume, ml	200
	Mg	L brown		Air rate, liters/hr	10
		Condensate return	Yes		

TEST NO. 357-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-883 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.41	—	3.31	0.25	3
16 hr	14.26	6.3	3.44	0.59	
24 hr	14.44	7.7	3.47	0.73	
40 hr	14.57	8.7	3.50	1.12	
48 hr	14.77	10.1	3.53	1.42	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.02		Centrifuge, vol %	0.4
	Ag	0.00	Tube deposits:	Total demerits	46
	Steel	-0.04			
	Cu	-0.06			
	Mg	+0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	No change	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	Pink	Sample volume, ml	200	
	Mg	L yellow	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 357-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-885 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.87	—	3.39	0.12	2
16 hr	14.68	5.8	3.49	0.48	
24 hr	14.87	7.2	3.52	0.61	
40 hr	14.97	7.9	3.53	0.81	
48 hr	15.09	8.8	3.55	0.95	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	0.2
	Ag	-0.02	Tube deposits:	Total demerits	80
	Steel	+0.02			
	Cu	-0.06			
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	No change	Test Conditions	Sample temperature, °F	392
	Steel	Blue		Sample volume, ml	200
	Cu	Brown-pink		Air rate, liters/hr	10
	Mg	L yellow		Condensate return	Yes

TEST NO. 357-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-884 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.80	—	3.32	0.18	
16 hr	14.57	5.6	3.45	0.46	
24 hr	14.74	6.8	3.47	0.58	
40 hr	14.83	7.5	3.48	0.79	
48 hr	14.99	8.6	3.50	0.89	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.02		Centrifuge, vol %	0.2
	Ag	-0.02	Tube deposits:	Total demerits	60
	Steel	0.00			
	Cu	0.04			
	Mg	0.00	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	48+	
			100°F vis, hr to 1 cs/8 hr	48+	
	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	392	
	Ag	No change	Sample volume, ml	200	
Steel	Blue	Air rate, liters/hr	10		
Cu	Brown-pink	Condensate return	Yes		
Mg	L yellow				

TEST NO. 357-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-869 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.80	—	3.36	0.15	
16 hr	14.35	4.0	3.44	0.38	
24 hr	14.51	5.1	3.49	0.44	
40 hr	14.63	6.0	3.48	0.65	
48 hr	14.70	6.5	3.50	0.84	3

Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace	
	Ti	0.00		Centrifuge, vol %	None	
	Ag	+0.04	Tube deposits:	Total demerits	58	
	Steel	0.00				
	Cu	-0.04				
	Mg	0.00	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	48+		
				100°F vis, hr to 1 cs/8 hr	48+	
			Test Conditions			
			Sample temperature, °F	392		
			Sample volume, ml	200		
		Air rate, liters/hr	10			
		Condensate return	Yes			
	Al	No change				
	Ti	No change				
	Ag	L yellow				
	Steel	Blue-green				
	Cu	Orange				
	Mg	No change				

TEST NO. 357-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-870 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.85	—	3.34	0.17	2
16 hr	14.48	4.5	3.44	0.38	
24 hr	14.61	5.5	3.48	0.49	
40 hr	14.71	6.2	3.49	0.70	
48 hr	14.83	7.1	3.50	0.73	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.06		Centrifuge, vol %	Trace
	Ag	+0.02	Tube deposits:	Total demerits	43
	Steel	0.00			
	Cu	0.02			
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	1 yellow	Test Conditions		Sample temperature, °F
	Steel	Blue-green		Sample volume, ml	200
	Cu	Orange		Air rate, liters/hr	10
	Mg	No change		Condensate return	Yes

TEST NO. 358-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34	—	4.58	0.26	
7 days	16.89	-2.6	4.45	1.23	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.08	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	+0.08	Tube deposits:	Total demerits	14
	Steel	+0.04		Breakpoint Data	
	Cu	-0.04		Neut. no., days to 1 mg KOH/g/4 days	7+
Metal discoloration, deposits, pitting, or etching:	Mg	-0.08			
	Al	L brown			
	Ti	L brown			
	Ag	L yellow			
	Steel	Blue			
			Test Conditions		
			Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 358-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34	—	4.58	0.26	
7 days	16.85	-2.8	4.43	1.27	
14 days	15.95	-8.0	4.16	2.97	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	24
	Steel	+0.02		Breakpoint Data	
	Cu	+0.02		Neut. no., days to 1 mg KOH/g/4 days	12
Metal discoloration, deposits, pitting, or etching:	Mg	+0.04			
	Al	L brown			
	Ti	L brown			
	Ag	Yellow			
	Steel	L yellow & blue			
			Test Conditions		
			Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 358-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34	-	4.58	0.26	
7 days	16.90	-2.5	4.44	1.21	
14 days	16.05	-7.4	4.19	2.47	
21 days	31.69	+82.8	6.62	39.7	10
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	0.4
	Ag	0.00	Tube deposits:	Total demerits	75
	Steel	+0.02			
	Cu	-1.53			
	Mg	-0.10	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	Yellow	Neut. no., days to 1 mg KOH/g/4 days	14	
	Ti	Yellow		100°F vis, days to 1 cs/4 days	17
	Ag	Yellow	Test Conditions		
	Steel	Orange	Sample temperature, °F	347	
	Cu	M pitting	Sample volume, ml	200	
	Mg	Tan	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 358-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	13.04	—	3.47	0.24		
7 days	13.27	1.8	3.46	1.88	2	
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None	
	Ti	+0.12		Centrifuge, vol %	None	
	Ag	+0.02	Tube deposits:	Total demerits	4	
	Steel	+0.12				
	Cu	0.34				
	Mg	+0.10				
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., days to 1 mg KOH/g/4 days	7+		
	Ti	l. yellow		100°F vis, days to 1 cs/4 days	7+	
	Ag	l. yellow	Test Conditions			
	Steel	Yellow				
	Cu	l. etching		Sample temperature, °F	347	
	Mg	l. brown		Sample volume, ml	200	
		Air rate, liters/hr	10			
		Condensate return	Yes			

TEST NO. 358-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 347°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.04		3.47	0.24	
7 days	13.30	2.0	3.47	1.83	
14 days	13.32	2.1	3.44	3.38	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	0.02	Tube deposits:	Total demerits	4
	Steel	-0.02		Breakpoint Data	
	Cu	-0.50		Neut. no., days to 1 mg KOH/g/4 days	12
	Mg	+0.08		100°F vis. days to 1 cs/4 days	14+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	347	
	Ag	L yellow		Sample volume, ml	200
	Steel	L yellow		Air rate, liters/hr	10
	Cu	L etching		Condensate return	Yes
	Mg	L yellow			

TEST NO. 358-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 347°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.04		3.47	0.24	
7 days	13.29	1.9	3.45	1.90	
14 days	13.51	3.6	3.44	5.74	
21 days	39.65	204	6.93	60.7	17
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.12	Tube deposits:	Total demerits	72
	Steel	0.00		Breakpoint Data	
	Cu	0.64		Neut. no., days to 1 mg KOH/g/4 days	8
	Mg	4.10		100°F vis. days to 1 cs/4 days	20
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	347	
	Ag	Gray		Sample volume, ml	200
	Steel	L brown & blue		Air rate, liters/hr	10
	Cu	L etching & pitting		Condensate return	Yes
	Mg	H etching			

TEST NO. 358-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 347°

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %	
Initial	13.04	--	3.47	0.24	5	
7 days	13.31	2.1	3.48	1.77		
14 days	13.34	2.3	3.47	2.35		
21 days	13.38	2.6	3.46	3.02		
26 days	13.40	2.8	3.46	2.99		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None	
	Ti	+0.02		Centrifuge, vol %	None	
	Ag	-0.10		Tube deposits:	Total demerits	1
	Steel	+0.02				
	CA674	+0.14				
	Mg	+0.08	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., days to 1 mg KOH/g/4 days	26+		
	Ti	No change		100°F vis, days to 1 cs/4 days	26+	
	Ag	Yellow	Test Conditions			
	Steel	L purple	Sample temperature, °F	347		
	CA674	Purple & green	Sample volume, ml	200		
	Mg	No change	Air rate, liters/hr	10		
			Condensate return	Yes		

TEST NO. 358-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.04	—	3.47	0.24	4
7 days	13.31	2.1	3.48	1.72	
14 days	13.34	2.3	3.37	2.41	
21 days	13.34	2.3	3.46	2.71	
26 days	13.38	2.6	3.46	2.95	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.08	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	2
	Steel	+0.06	Breakpoint Data		
	CA674	+0.06	Neut. no., days to 1 mg KOH/g/4 days	26+	
	Mg	+0.06	100°F vis, days to 1 cs/4 days	26+	
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	347	
	Ag	Yellow	Sample volume, ml	200	
	Steel	L purple	Air rate, liters/hr	10	
	CA674	Purple & L green	Condensate return	Yes	
	Mg	No change			

TEST NO. 359-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-8 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.24	—	3.26	0.23	4
16 hr	14.40	8.8	3.46	1.22	
24 hr	14.57	10.0	3.47	1.42	
40 hr	14.85	12.2	3.54	1.78	
48 hr	14.99	13.2	3.56	2.11	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	14
	Steel	0.00			
	Cu	-0.26			
	Mg	-0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	48+	
			100°F vis, hr to 1 cs/8 hr	48+	
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	No change	Sample volume, ml	200	
	Ag	L brown	Air rate, liters/hr	10	
	Steel	Blue	Condensate return	Yes	
	Cu	L etching			
	Mg	L yellow			

TEST NO. 359-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-21 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.92	—	3.15	0.14	2
16 hr	13.77	6.6	3.26	0.57	
24 hr	13.94	7.9	3.31	0.84	
40 hr	14.12	9.3	3.33	1.08	
48 hr	14.21	10.0	3.36	1.30	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	19
	Steel	0.02			
	Cu	0.06			
	Mg	0.02			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Blue-green	Sample temperature, °F	392	
	Cu	Gold	Sample volume, ml	200	
	Mg	Gray	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 359-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-6 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.10	-	3.19	0.29	
16 hr	14.16	8.1	3.35	1.41	
24 hr	14.43	10.2	3.39	1.95	
40 hr	17.01	29.8	3.77	8.46	
48 hr	18.59	41.9	3.99	12.08	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filt +	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	6
	Steel	0.00		Breakpoint Data	
	Cu	-0.90		Neut. no., hr to 1 mg KOH/g/8 hr	25
Metal discoloration, deposits, pitting, or etching:	Mg	-1.00	100°F vis, hr to 1 cs/8 hr	27	
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	No change	Sample volume, ml	200	
	Ag	L yellow	Air rate, liters/hr	10	
	Steel	Blue-green-brown	Condensate return	Yes	

TEST NO. 360-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON L-1136A^(a) AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.08		4.13	0.15	
7 days	15.84	1.5	4.04	1.26	
14 days	16.06	0.1	4.05	1.73	
21 days	15.68	2.5	3.95	2.51	
26 days	15.81	1.7	3.98	2.33	17
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.02	Tube deposits:	Total demerits	20
	Steel	0.00		Breakpoint Data	
	Cu	0.56		Neut. no., days to 1 mg KOH/g/4 days	26+
	Mg	0.00		100°F vis, days to 1 cs/4 days	26+
Metal discoloration, deposits, pitting, or etching	Al	Yellow	Test Conditions		
	Ti	Blue	Sample temperature, °F	347	
	Ag	L yellow		Sample volume, ml	
	Steel	Green		200	
	Cu	L pitting		Air rate, liters/hr	
	Mg	Yellow		10	
			Condensate return		
			Yes		
(a) Blend (1:1) of O-67-7 and O-67-9.					

TEST NO. 360-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.29	—	3.21	0.00	
7 days	14.43	8.6	3.40	0.47	
14 days	14.71	10.7	3.43	0.67	
21 days	14.97	12.6	3.47	0.63	
26 days	15.07	13.4	3.54	0.73	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	6
	Steel	+0.02		Breakpoint Data	
	Cu	-0.08		Neut. no., days to 1 mg KOH/g/4 days	26+
	Mg	-0.04		100°F vis, days to 1 cs/4 days	26+
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Test Conditions		
	Ti	Pale-gold	Sample temperature, °F	347	
	Ag	Tan		Sample volume, ml	200
	Steel	Blue-green		Air rate, liters/hr	10
	Cu	Gold		Condensate return	Yes
	Mg	No change			

TEST NO. 361-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.10		3.19	0.29	
16 hr	14.11	7.7	3.33	1.25	
24 hr	14.28	9.0	3.35	1.65	
40 hr	15.81	20.7	3.56	5.40	
48 hr	17.59	34.3	3.83	9.37	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	4
	Steel	0.00		Breakpoint Data	
	Cu	0.44		Neut. no., hr to 1 mg KOH/g/8 hr	27
	Mg	0.20		100°F vis, hr to 1 cs/8 hr	27
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	385	
	Ag	1 yellow		Sample volume, ml	200
	Steel	Blue & gold		Air rate, liters/hr	10
	Cu	1 yellow		Condensate return	Yes
	Mg	1 pitting & etching			

TEST NO. 362-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-8 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.24	—	3.25	0.23	3
16 hr	14.50	9.5	3.47	1.51	
24 hr	14.72	11.2	3.50	1.77	
40 hr	15.00	13.3	3.55	2.24	
48 hr	15.16	14.5	3.59	2.49	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	−0.04	Tube deposits:	Total demerits	2
	Steel	+0.02			
	Cu	−0.24			
	Mg	−0.02			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions	Sample temperature, °F	401
	Steel	Blue-green		Sample volume, ml	200
	Cu	L etching		Air rate, liters/hr	10
	Mg	Yellow		Condensate return	Yes

TEST NO. 362-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-21 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	12.92	-	3.15	0.14	2
16 hr	13.89	7.5	3.31	0.83	
24 hr	13.98	8.2	3.34	0.99	
40 hr	14.31	10.8	3.36	1.47	
48 hr	14.42	11.6	3.39	1.67	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil: 200-mesh filter	None	
	Ti	+0.04		Centrifuge, vol %	
	Ar	0.00	Tube deposits: Total demerits		
	Steel	+0.02			
	Cu	0.02	12		
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching:			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	No change	Sample temperature, °F	401	
	Ti	L yellow		Sample volume, ml	
Ag	No change	200			
Steel	Green	Air rate, liters/hr			
Cu	Gold	10			
Mg	No change	Condensate return		Yes	

TEST NO. 362-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-7 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.69		3.38	0.08	
16 hr	14.56	6.4	3.52	1.23	
24 hr	14.78	8.0	3.55	1.91	
40 hr	15.21	11.1	3.61	3.19	
48 hr	16.45	20.2	3.79	8.07	3

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	29
	Steel	+0.04			
	Cu	-0.02			
	Mg	+0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		36
			100°F vis, hr to 1 cs/8 hr		45
			Test Conditions		
	Al	No change	Sample temperature, °F	401	
	Ti	No change	Sample volume, ml	200	
Ag	L yellow	Air rate, liters/hr	10		
Steel	Green	Condensate return	Yes		
Cu	Gold				
Mg	No change				

TEST NO. 363-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-10 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.24		3.98	0.28	
16 hr	15.25	+0.1	3.91	1.17	
24 hr	15.29	+0.3	3.93	1.49	
40 hr	15.28	+0.3	3.91	2.09	
48 hr	15.22	0.1	3.89	2.50	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil: 200-mesh filter	None	
	Ti	0.14		Centrifuge, vol, %	
	Ag	+0.02	Tube deposits: Total demerits	2	
	Steel	+0.06			
	Cu	0.00			
	Mg	+0.10			
Metal discoloration, deposits, pitting, or etching			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	1 blue	Sample temperature, °F		392
	Ti	1 yellow	Sample volume, ml		200
Ag	Gray	Air rate, liters/hr		10	
Steel	Brown & blue	Condensate return		Yes	
Cu	Orange				
Mg	Gray				

TEST NO. 363-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-891 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.95	—	3.34	0.16	
16 hr	14.55	4.3	3.43	0.48	
24 hr	14.73	5.6	3.47	0.66	
40 hr	14.98	7.4	3.51	0.88	
48 hr	15.07	8.0	3.52	1.08	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.02		Centrifuge, vol %	Trace
	Ag	-0.04	Tube deposits:	Total demerits	
	Steel	-0.02		Breakpoint Data	
	Cu	+0.06		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	-0.04		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F		
	Ag	No change	Sample volume, ml		
	Steel	Blue	Air rate, liters/hr		
	Cu	Pink	Condensate return		
	Mg	No change			

TEST NO. 363-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1052^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.58	—	3.41	0.16	
16 hr	14.05	3.5	3.47	0.52	
24 hr	14.15	4.2	3.46	0.80	
40 hr	14.30	5.3	3.47	1.57	
48 hr	15.54	14.4	3.62	6.34	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	-0.12		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	
	Steel	0.00		3	
	Cu	-0.24		Breakpoint Data	
	Mg	-0.04		Neut. no., hr to 1 mg KOH/g/8 hr	59
Metal discoloration, deposits, pitting, or etching			100°F vis, hr to 1 cs/8 hr	44	
	Al	1 brown	Test Conditions		
	Ti	No change	Sample temperature, °F	392	
	Ag	Gray	Sample volume, ml	200	
	Steel	Blue	Air rate, liters/hr	10	
	Cu	1 etching	Condensate return	Yes	
Mg	1 blue				
(a) Blend (1:1:1:1) of O-67-9, O-67-11, O-67-20, and O-67-24.					

TEST NO. 363-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON N-1000^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.56	-	3.37	0.15	
16 hr	13.95	2.9	3.40	0.61	
24 hr	14.14	4.3	3.44	1.01	
40 hr	14.35	5.8	3.43	1.67	
48 hr	15.40	13.6	3.60	5.81	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil: 200-mesh filter Centrifuge, vol %	None	
	Ti	-0.14		None	
	Ag	-0.02	Tube deposits: Total demerits	16	
	Steel	-0.10			
	Cu	-0.20			
	Mg	-0.04			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr		40
	Ag	Gray	100°F vis, hr to 1 cs/8 hr		46
	Steel	Purple	Test Conditions		
	Cu	L etching	Sample temperature, °F		392
	Mg	L green	Sample volume, ml		200
			Air rate, liters/hr		10
			Condensate return		Yes
(a) Blend (1:1:1:1:1) of O-67-9, O-67-11, O-67-20, O-67-24, and O-68-6.					

TEST NO. 363-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON N-1001^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.65	—	3.41	0.11	
16 hr	14.14	3.6	3.45	0.56	
24 hr	14.18	3.9	3.48	0.81	
40 hr	14.44	5.8	3.48	1.45	
48 hr	14.56	6.7	3.52	1.85	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil	200-mesh filter	None
	Ti	0.12		Centrifuge, vol. %	None
	Ag	0.02	Tube deposits	Total demerits	2
	Steel	0.12			
	Cu	-0.16			
	Mg	0.02			
Metal discoloration, deposits, pitting, or etching	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Gray	Test Conditions		
	Steel	Purple	Sample temperature, °F	392	
	Cu	Brown	Sample volume, ml	200	
	Mg	L blue	Air rate, liters/hr	10	
			Condensate return	Yes	
* (a) Blend (1:1:1:1:1) of O-67-9, O-67-11, O-67-20, O-67-24, and O-68-7.					

TEST NO. 364-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-8 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.24	—	3.26	0.23	5
16 hr	14.66	10.7	3.49	2.02	
24 hr	14.96	13.0	3.55	2.03	
40 hr	15.51	17.1	3.61	3.05	
48 hr	16.18	22.2	3.74	5.17	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.08		Centrifuge, vol %	None
	Ag	-0.10	Tube deposits:	Total demerits	—
	Steel	+0.06			
	Cu	-0.36			
	Mg	-0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	38	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Blue-green	Sample temperature, °F	410	
	Cu	L etching	Sample volume, ml	200	
	Mg	Gray	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 364-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-21 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.92	—	3.15	0.14	3
16 hr	14.03	8.6	3.22	1.05	
24 hr	14.26	10.4	3.36	1.08	
40 hr	14.57	12.8	3.40	1.71	
48 hr	14.77	14.3	3.44	2.47	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.10	Sludge in oil:	200-mesh filter	None
	Ti	-0.06		Centrifuge, vol %	None
	Ag	-0.14	Tube deposits:	Total demerits	8
	Steel	+0.06			
	Cu	-0.08			
	Mg	-0.04	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	46	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Blue-yellow	Sample temperature, °F	410	
	Cu	Gold	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 363-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON N-1000^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.56	—	3.37	0.15	5
16 hr	13.95	2.9	3.40	0.61	
24 hr	14.14	4.3	3.44	1.01	
40 hr	14.35	5.8	3.43	1.67	
48 hr	15.40	13.6	3.60	5.81	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	-0.14		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	16
	Steel	-0.10			
	Cu	-0.20			
	Mg	-0.04	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		40
	Ti	No change	100°F vis, hr to 1 cs/8 hr		46
	Ag	Gray	Test Conditions		
	Steel	Purple	Sample temperature, °F	392	
	Cu	L etching	Sample volume, ml	200	
	Mg	L green	Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1:1:1) of O-67-9, O-67-11, O-67-20, O-67-24, and O-68-6.					

TEST NO. 363-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON N-1001^(a) AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.65	—	3.41	0.11	4
16 hr	14.14	3.6	3.45	0.56	
24 hr	14.18	3.9	3.48	0.81	
40 hr	14.44	5.8	3.48	1.45	
48 hr	14.56	6.7	3.52	1.85	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	-0.12		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	2
	Steel	-0.12			
	Cu	-0.16			
	Mg	-0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	No change	100°F vis, hr to 1 cs/8 hr		48+
	Ag	Gray	Test Conditions		
	Steel	Purple	Sample temperature, °F	392	
	Cu	Brown	Sample volume, ml	200	
	Mg	L blue	Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1:1:1:1) of O-67-9, O-67-11, O-67-20, O-67-24, and O-68-7.					

TEST NO. 364-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.29	—	3.21	0.00	3
16 hr	14.37	8.1	3.35	0.76	
24 hr	14.58	9.7	3.41	1.00	
40 hr	14.94	12.4	3.45	1.49	
48 hr	15.25	14.7	3.51	2.20	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.06	Sludge in oil:	200-mesh filter	None
	Ti	−0.12		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	17
	Steel	+0.08			
	Cu	−0.10			
	Mg	−0.02			
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Breakpoint Data		
	Ti	Yellow	Neut. no., hr to 1 mg KOH/g/8 hr	47	
	Ag	L brown		100°F vis, hr to 1 cs/8 hr	48+
	Steel	Blue & yellow	Test Conditions		
	Cu	Green & orange	Sample temperature, °F	410	
	Mg	No change	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 365-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-6 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.10		3.19	0.29	
7 days	15.45	17.9	3.55	3.37	
14 days	70.31	437	9.72	25.3	
21 days	90.36	590	11.92	21.6	
26 days	79.37	506	11.16	17.04	27
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	15
	Steel	-0.06			
	Cu	-4.20			
	Mg	-16.5			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., days to 1 mg KOH/g/4 days	2	
	Ti	No change		100°F vis, days to 1 cs/4 days	3
	Ag	L yellow	Test Conditions		
	Steel	Blue-green			
	Cu	L & M pitting	Sample temperature, °F	347	
	Mg	H etching	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 365-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-7 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.69	—	3.38	0.08	8
7 days	14.72	7.5	3.56	0.94	
14 days	15.03	9.8	3.61	1.38	
21 days	15.17	10.8	3.64	1.46	
26 days	15.24	11.3	3.65	1.54	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	−0.10	Tube deposits:	Total demerits	49
	Steel	−0.06			
	Cu	−0.12			
	Mg	+0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., days to 1 mg KOH/g/4 days	26+	
	Ti	No change		100°F vis, days to 1 cs/4 days	26+
	Ag	L brown	Test Conditions		
	Steel	Blue-green	Sample temperature, °F	347	
		Cu	Gold	Sample volume, ml	200
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 365-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1052(a) AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.58	—	3.41	0.16	8
7 days	14.29	5.2	3.50	0.71	
14 days	14.57	7.3	3.53	1.11	
21 days	14.81	9.1	3.56	1.11	
26 days	14.86	9.4	3.60	1.18	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.06	Tube deposits:	Total demerits	58
	Steel	-0.08			
	Cu	-0.42			
	Mg	+0.08			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., days to 1 mg KOH/g/4 days	26+	
	Ag	Tan	100°F vis, days to 1 cs/4 days	26+	
	Steel	Blue-green	Test Conditions		
	Cu	L etching & pitting	Sample temperature, °F	347	
	Mg	Peacock	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1:1:1) of O-67-9, O-67-11, O-67-20, and O-67-24					

TEST NO. 366-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-10 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.24	—	3.98	0.28	4
16 hr	15.20	-0.3	3.91	1.55	
24 hr	15.24	0.0	3.91	2.05	
40 hr	15.13	-0.7	3.82	3.97	
48 hr	16.83	+10.4	3.99	14.56	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	None
	Ti	-0.04		Centrifuge, vol %	L trace
	Ag	-0.04	Tube deposits:	Total demerits	2
	Steel	+0.06			
	Cu	-0.18			
	Mg	-1.60	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	35	
			100°F vis, hr to 1 cs/8 hr	45	
			Test Conditions		
	Al	L blue	Sample temperature, °F	401	
	Ti	L yellow	Sample volume, ml	200	
	Ag	Tan	Air rate, liters/hr	10	
	Steel	Peacock	Condensate return	Yes	
	Cu	Brown			
	Mg	M pitting			

TEST NO. 368-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-10 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.24	—	3.98	0.28	
7 days	15.52	1.8	3.97	1.55	
14 days	15.30	0.4	3.88	2.89	
21 days	20.87	36.9	4.59	26.7	
26 days	34.64	127	6.49	50.5	19
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.02	Sludge in oil: 200-mesh filter	None	
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.08	Tube deposits: Total demerits	76	
	Steel	+0.02			
	Cu	0.94			
Mg	0.18	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching	Al	L yellow	Neut. no., days to 1 mg KOH/g/4 days		12
	Ti	No change	100°F vis, days to 1 cs/4 days		18
	Ag	Tan	Test Conditions		
	Steel	Peacock	Sample temperature, °F	347	
	Cu	M pitting	Sample volume, ml	200	
Mg	Brown	Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 368-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-15 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.90	—	3.11	0.13	4
7 days	13.65	5.8	3.23	0.59	
14 days	13.97	8.3	3.28	0.68	
21 days	14.28	10.7	3.34	0.91	
26 days	14.56	12.9	3.38	1.32	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.08		Centrifuge, vol %	None
	Ag	-0.08	Tube deposits:	Total demerits	40
	Steel	-0.04			
	Cu	-0.14			
	Mg	0.00	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., days to 1 mg KOH/g/4 days	26+	
	Ti	No change		100°F vis, days to 1 cs/4 days	26+
	Ag	L yellow	Test Conditions		
	Steel	Blue-green	Sample temperature, °F	347	
		Cu	Orange-gold	Sample volume, ml	200
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 368-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON N-1000(a) AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.56	—	3.37	0.15	9
7 days	14.38	6.0	3.48	0.86	
14 days	14.68	8.3	3.53	1.08	
21 days	14.91	10.0	3.56	1.20	
26 days	15.01	10.7	3.58	1.23	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	Trace
	Ag	-0.08	Tube deposits:	Total demerits	36
	Steel	0.00			
	Cu	-0.34			
	Mg	+0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., days to 1 mg KOH/g/4 days	26+	
	Ti	No change		100°F vis, days to 1 cs/4 days	26+
	Ag	Tan	Test Conditions		
	Steel	Blue	Sample temperature, °F	347	
		Cu	L etch, ng	Sample volume, ml	200
	Mg	L green	Air rate, liters/hr	10	
			Condensate return	Yes	

(a) Blend (1:1:1:1:1) of O-67-9, O-67-11, O-67-20, O-67-24, and O-68-6.

(a) Blend (1:1:1:1) of O-67-9, O-67-11, O-67-20, O-67-24, and O-68-6.

TEST NO. 368-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON N-1001(a) AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.65	—	3.41	0.11	
7 days	14.36	5.9	3.52	0.61	
14 days	14.12	7.8	3.56	1.02	
21 days	14.90	9.2	3.59	1.20	
26 days	14.95	9.5	3.60	1.35	10
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.08	Tube deposits:	Total demerits	49
	Steel	-0.06		Breakpoint Data	
	Cu	-0.42		Neut. no., days to 1 mg KOH/g/4 days	26+
	Mg	+0.04		100°F vis, days to 1 cs/4 days	26+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	347	
	Ag	Tan	Sample volume, ml	200	
	Steel	Blue	Air rate, liters/hr	10	
	Cu	L etching & pitting	Condensate return	Yes	
	Mg	L green			
(a) Blend (1:1:1:1:1) of O-67-9, O-67-11, O-67-20, O-67-24, and O-68-7.					

TEST NO. 369-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-8 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.34		3.26	0.23	
16 hr	14.71	10.3	3.52	1.92	
24 hr	15.12	13.3	3.58	2.42	
40 hr	16.80	25.9	3.83	6.39	
48 hr	18.40	37.9	4.09	10.11	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	81
	Steel	+0.02		Breakpoint Data	
	Cu	0.82		Neut. no., hr to 1 mg KOH/g/8 hr	30
Metal discoloration, deposits, pitting, or etching:	Mg	0.06	Test Conditions		
	Al	No change	Sample temperature, °F		
	Ti	No change	Sample volume, ml		
	Ag	No change	Air rate, liters/hr		
	Steel	Blue-green	Condensate return		
	Cu	L etching			
	Mg	Brown			

TEST NO. 369-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-21 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.92	—	3.15	0.14	2
16 hr	14.08	9.0	3.34	1.35	
24 hr	14.37	11.2	3.38	1.74	
40 hr	15.29	18.3	3.52	3.47	
48 hr	16.75	29.6	3.73	6.43	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	9
	Steel	0.00			
	Cu	0.00			
	Mg	-0.28			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	34	
	Ag	No change		100°F vis, hr to 1 cs/8 hr	44
	Steel	Brown-green	Test Conditions		
	Cu	Gold	Sample temperature, °F	419	
	Mg	L pitting	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 370-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-12 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.47	-	3.25	0.17	
16 hr	14.36	6.6	3.40	0.66	
24 hr	14.53	7.9	3.42	0.80	
40 hr	14.73	9.4	3.46	0.95	
48 hr	14.72	9.3	3.47	1.13	1
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	-0.02		Centrifuge, vol %	None
	Ag	0.00	Tub: deposits:	Total demerits	2
	Steel	0.00			
	Cu	0.12			
	Mg	0.02			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Gray	Test Conditions		
	Steel	Blue-brown	Sample temperature, °F	392	
	Cu	Brown	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 370-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-14 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.35	—	3.32	0.14	2
16 hr	14.16	6.1	3.44	1.01	
24 hr	14.38	7.7	3.46	1.57	
40 hr	14.63	9.6	3.51	2.28	
48 hr	14.68	10.0	3.53	2.63	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² .	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	15
	Steel	0.00			
	Cu	0.00			
	Mg	+0.02			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ag	L yellow	100°F vis, hr to 1 cs/8 hr	48+	
	Steel	Peacock	Test Conditions		
	Cu	Orange	Sample temperature, °F	392	
	Mg	No change	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 370-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-15 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.90	-	3.11	0.13	
16 hr	13.31	3.2	3.17	0.35	
24 hr	13.51	4.7	3.21	0.59	
40 hr	13.78	6.8	3.23	1.01	
48 hr	13.91	7.8	3.27	1.40	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	9
	Steel	0.00			
	Cu	+0.04			
	Mg	+0.04			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	No change	Test Conditions		
	Steel	Blue-brown			
	Cu	Gold			
	Mg	No change			
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 370-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-888 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.85	—	3.32	0.13	2
16 hr	14.52	4.8	3.44	0.40	
24 hr	14.61	5.5	3.46	0.70	
40 hr	14.85	7.2	3.48	0.92	
48 hr	14.94	7.9	3.50	0.90	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	+0.02	Tube deposits:	Total demerits	115
	Steel	0.00			
	Cu	0.00			
Metal discoloration, deposits, pitting, or etching:	Mg	+0.50	Breakpoint Data		
	Al Ti Ag Steel Cu Mg	No change No change L brown Blue Brown-green Gray deposit	Neut. no., hr to 1 mg KOH/g/8 hr		48+
		100°F vis, hr to 1 cs/8 hr		48+	
		Test Conditions			
		Sample temperature, °F	392		
Sample volume, ml	200				
Air rate, liters/hr	10				
Condensate return	Yes				

TEST NO. 370-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-889 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.90	—	3.33	0.12	3
16 hr	14.57	4.8	3.43	0.49	
24 hr	14.81	6.5	3.48	0.64	
40 hr	14.97	7.7	3.48	0.79	
48 hr	15.08	8.5	3.52	0.92	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil.	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	0.2
	Ag	+0.02	Tube deposits:	Total demerits	144
	Steel	0.00			
	Cu	-0.02			
	Mg	+0.10			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L brown	Test Conditions		
	Steel	Blue			
	Cu	Violet	Sample temperature, °F	392	
	Mg	Brown	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 370-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-890 AT 392°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.38		3.42	0.17	
16 hr	14.93	3.8	3.50	0.44	
24 hr	15.18	5.6	3.55	0.60	
40 hr	15.39	7.0	3.59	0.76	
48 hr	15.51	7.9	3.60	0.77	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	0.4
	Ag	0.00	Tube deposits:	Total demerits	75
	Steel	0.00			
	Cu	+0.02			
	Mg	+0.06			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	No change	Test Conditions	Sample temperature, °F	392
	Steel	Blue-green		Sample volume, ml	200
	Cu	Pink		Air rate, liters/hr	10
	Mg	No change		Condensate return	Yes

TEST NO. 370-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-892 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.89		3.51	0.17	
16 hr	14.51	4.5	3.58	1.44	
24 hr	14.80	6.6	3.62	1.84	
40 hr	15.11	8.8	3.70	2.61	
48 hr	15.55	12.0	3.74	5.19	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil	200-mesh filter	None
	Ti	0.00		Centrifuge, vol. %	None
	Ag	+0.02	Tube deposits	Total demerits	2
	Steel	0.00			
	Cu	0.16			
	Mg	+0.04			
Metal discoloration, deposits, pitting, or etching			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr	40	
			100°F vis, hr to 1 cs/8 hr	48+	
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	No change	Sample volume, ml	200	
Ag	Tan	Air rate, liters/hr	10		
Steel	Purple	Condensate return	Yes		
Cu	Brown				
Mg	No change				

TEST NO. 372-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON N-1001^(a) AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.65	—	3.41	0.11	5
16 hr	14.18	3.9	3.46	0.99	
24 hr	14.32	4.9	3.48	1.50	
40 hr	16.36	19.9	3.74	8.46	
48 hr	18.72	37.1	4.10	12.97	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.08	Sludge in oil:	200-mesh filter:	None
	Ti	-0.06		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	48
	Steel	0.06		Breakpoint Data	
	Cu	-0.24		Neut. no., hr to 1 mg KOH/g/8 hr	26
Metal discoloration, deposits, pitting, or etching:	Mg	-0.12	100°F vis, hr to 1 cs/8 hr 33		
	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	401	
	Ag	L yellow	Sample volume, ml	200	
	Steel	Blue	Air rate, liters/hr	10	
Cu	L etching	Condensate return	Yes		
Mg	Brown				
(a) Blend (1:1:1:1:1) of O-67-9, O-67-11, O-67-20, O-67-24, and O-68-7.					

TEST NO. 373-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-4 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.01	—	3.93	0.11	
16 hr	15.27	1.7	3.95	1.31	
24 hr	15.22	1.4	3.94	1.39	
40 hr	15.08	0.5	3.90	1.74	
48 hr	15.06	0.3	3.89	1.90	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	Trace
	Ag	0.00	Tube deposits:	Total demerits	92
	Steel	-0.02		Breakpoint Data	
	Cu	-0.10		Neut. no., hr to 1 mg KOH/g/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Mg	-0.90	Test Conditions		
	Al	L brown	Sample temperature, °F		
	Ti	Pink	Sample volume, ml		
	Ag	L yellow	Air rate, liters/hr		
	Steel	Violet & green	Condensate return		
	Cu	Brown			
	Mg	L pitting			

TEST NO. 373-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.79	—	3.52	0.52	3
16 hr	15.14	9.8	3.70	1.41	
24 hr	14.54	5.4	3.68	1.85	
40 hr	15.01	8.8	3.72	2.12	
48 hr	14.72	6.7	3.68	2.55	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.06		Centrifuge, vol %	0.2
	Ag	+0.16	Tube deposits:	Total demerits	384
	Steel	+0.06			
	Cu	-0.14			
	Mg	-0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	Brown	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	Brown		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Brown	Test Conditions		
	Steel	Brown	Sample temperature, °F	385	
	Cu	Black	Sample volume, ml	200	
Mg	Brown	Air rate, liters/hr	10		
			Condensate return	Yes	

TEST NO. 373-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-18 AT 385°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.84	—	4.29	0.11	3
16 hr	17.11	+1.6	4.30	1.36	
24 hr	17.04	+1.2	4.30	1.49	
40 hr	16.75	-0.5	4.18	2.58	
48 hr	16.50	-2.0	4.04	6.93	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	-0.02	Tube deposits:	Total demerits	36
	Steel	-0.06			
	Cu	-0.16			
	Mg	-0.12	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	38	
			100°F vis, hr to 1 cs/8 hr	48+	
	Al	L green	Test Conditions		
	Ti	Green	Sample temperature, °F	385	
	Ag	L yellow	Sample volume, ml	200	
Steel	Yellow-green	Air rate, liters/hr	10		
Cu	Peacock	Condensate return	Yes		
Mg	Gray				

TEST NO. 373-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.34	~	4.58	0.26	5
16 hr	17.04	-1.7	4.47	0.94	
24 hr	16.87	-2.7	4.44	1.12	
40 hr	16.44	-5.5	4.23	1.53	
48 hr	15.59	-10.1	4.05	3.29	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	None
	Ti	-0.02		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	82
	Steel	0.00		Breakpoint Data	
	Cu	-0.10			
Metal discoloration, deposits, pitting, or etching:	Mg	-0.16	Neut. no., hr to 1 mg KOH/g/8 hr		41
			100°F vis, hr to 1 cs/8 hr		48+
	Test Conditions				
			Sample temperature, °F	385	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 373-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.87	—	3.69	0.04	3
16 hr	15.04	1.1	3.72	0.67	
24 hr	14.99	0.8	3.72	0.84	
40 hr	14.94	0.5	3.69	1.09	
48 hr	14.87	0.0	3.66	1.28	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	None
	Ti	−0.06		Centrifuge, vol %	None
	Ag	−0.02	Tube deposits:	Total demerits	45
	Steel	−0.04		Breakpoint Data	
	Cu	−0.30			
Metal discoloration, deposits, pitting, or etching:	Mg	0.00	Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
	Test Conditions				
			Sample temperature, °F	385	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 373-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.04	—	3.47	0.24	4
16 hr	13.15	0.8	3.45	1.23	
24 hr	13.20	1.2	3.46	1.48	
40 hr	13.24	1.5	3.44	2.00	
48 hr	13.26	1.7	3.45	2.30	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.10	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	−0.02	Tube deposits:	Total demerits	4
	Steel	+0.04			
	Cu	−0.12			
	Mg	+0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	48+	
			100°F vis, hr to 1 cs/8 hr	48+	
			Test Conditions		
	Al	No change	Sample temperature, °F	385	
	Ti	No change	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		
	Ag	Tan			
	Steel	L brown			
	Cu	Brown			
	Mg	L blue			

TEST NO. 374-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-4 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.01	—	3.93	0.11	3
16 hr	15.12	0.7	3.94	1.44	
24 hr	15.21	1.3	3.91	1.62	
40 hr	15.02	0.1	3.88	1.96	
48 hr	15.19	1.2	3.79	6.89	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	Trace
	Ag	-0.02	Tube deposits:	Total demerits	106
	Steel	+0.06			
	Cu	-0.28			
	Mg	-1.88	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	40	
			100°F vis, hr to 1 cs/8 hr	48+	
			Test Conditions		
	Al	L brown	Sample temperature, °F	392	
	Ti	Pink	Sample volume, ml	200	
Ag	Yellow	Air rate, liters/hr	10		
Steel	Green	Condensate return	Yes		
Cu	L etching				
Mg	L pitting				

TEST NO. 374-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.79	—	3.52	0.52	
16 hr	15.00	8.8	3.73	1.71	
24 hr	15.01	8.8	3.70	2.23	
40 hr	15.01	8.8	3.71	2.75	
48 hr	14.82	7.5	3.69	3.24	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.26	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.24		Centrifuge, vol %	0.2
	Ag	+0.10	Tube deposits:	Total demerits	406
	Steel	+0.18		Breakpoint Data	
	Cu	+0.04		Neut. no., hr to 1 mg KOH/g/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Mg	+0.10	Test Conditions		
	Al	Brown deposit	Sample temperature, °F		
	Ti	Brown deposit	Sample volume, ml		
	Ag	Brown	Air rate, liters/hr		
	Steel	Black	Condensate return		
	Cu	Black			
	Mg	L brown			

TEST NO. 374-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-18 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	16.84	—	4.29	0.11	
16 hr	17.03	+1.1	4.28	1.53	
24 hr	16.91	+0.4	4.23	2.99	
40 hr	16.75	-0.5	4.06	7.71	
48 hr	18.31	+8.7	4.27	13.06	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	Trace
	Ag	+0.04	Tube deposits:	Total demerits	96
	Steel	0.00		Breakpoint Data	
	Cu	-0.32		Neut. no., hr to 1 mg KOH/g/8 hr	25
Metal discoloration, deposits, pitting, or etching:	Mg	-0.06	Test Conditions		
	Al	L green	Sample temperature, °F		
	Ti	L green	Sample volume, ml		
	Ag	Green-yellow	Air rate, liters/hr		
	Steel	Yellow	Condensate return		
	Cu	L etching			
	Mg	Gray			

TEST NO. 375-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-6 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.10	—	3.19	0.29	
16 hr	13.87	5.9	3.31	0.84	
24 hr	14.04	7.2	3.34	1.12	
40 hr	14.35	9.5	3.38	1.63	
48 hr	14.61	11.5	3.43	2.13	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.08	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	−0.02	Tube deposits:	Total demerits	13
	Steel	0.00		Breakpoint Data	
	Cu	−0.24		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	+0.06		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	L yellow	Sample temperature, °F	374	
	Ag	L brown		Sample volume, ml	
	Steel	Brown & purple		Air rate, liters/hr	
	Cu	L etching		Condensate return	
	Mg	L green		Yes	

TEST NO. 376-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-4 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.01	—	3.93	0.11	
16 hr	15.18	1.1	3.91	1.65	
24 hr	15.10	0.6	3.89	1.93	
40 hr	17.21	14.7	4.09	12.18	
48 hr	30.74	104	6.91	15.70	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.10		Centrifuge, vol %	0.2
	Ag	+0.04	Tube deposits:	Total demerits	210
	Steel	−0.04		Breakpoint Data	
	Cu	−0.56		Neut. no., hr to 1 mg KOH/g/8 hr	29
	Mg	−19.0		100°F vis, hr to 1 cs/8 hr	34
Metal discoloration, deposits, pitting, or etching:	Al	Brown	Test Conditions		
	Ti	Pink	Sample temperature, °F	401	
	Ag	Pink		Sample volume, ml	
	Steel	Green		Air rate, liters/hr	
	Cu	L etching		Condensate return	
	Mg	H pitting & etching		Yes	

TEST NO. 376-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.79	—	3.52	0.52	3
16 hr	15.31	11.0	3.70	2.13	
24 hr	14.92	8.2	3.69	2.52	
40 hr	14.97	8.6	3.72	3.55	
48 hr	15.14	9.8	3.73	5.24	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.38	Sludge in oil:	200-mesh filter	1.7
	Ti	+0.34		Centrifuge, vol %	0.2
	Ag	+0.28	Tube deposits:	Total demerits	457
	Steel	+0.28			
	Cu	−0.04			
	Mg	+0.44	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		39
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	Brown deposit	Sample temperature, °F	401	
	Ti	Black deposit	Sample volume, ml	200	
	Ag	Black deposit	Air rate, liters/hr	10	
	Steel	Black deposit	Condensate return	Yes	
	Cu	Brown			
	Mg	Brown deposit			

TEST NO. 376-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-18 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.84	—	4.29	0.11	
16 hr	16.90	+0.4	4.23	1.93	
24 hr	16.48	−2.1	4.08	3.47	
40 hr	18.91	+12.3	4.34	8.88	
48 hr	21.17	+25.7	4.74	18.37	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.06		Centrifuge, vol %	Trace
	Ag	+0.06	Tube deposits:	Total demerits	68
	Steel	+0.02			
	Cu	−0.74			
	Mg	+0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	10	
			100°F vis, hr to 1 cs/8 hr	31	
			Test Conditions		
	Al	L green	Sample temperature, °F	401	
	Ti	Green-yellow	Sample volume, ml	200	
Ag	Green-yellow	Air rate, liters/hr	10		
Steel	Gold	Condensate return	Yes		
Cu	L etching				
Mg	Brown				

TEST NO. 377-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.79	—	3.52	0.52	
16 hr	15.09	9.4	3.74	2.52	
24 hr	15.09	9.4	3.73	3.33	
40 hr	16.89	22.5	3.99	11.15	
48 hr	19.03	38.0	4.39	15.14	6
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.54	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.44		Centrifuge, vol %	Trace
	Ag	+0.22	Tube deposits:	Total demerits	470
	Steel	+0.34		Breakpoint Data	
	Cu	-0.80		Neut. no., hr to 1 mg KOH/g/8 hr	22
	Mg	+0.40		100°F vis, hr to 1 cs/8 hr	34
Metal discoloration, deposits, pitting, or etching:	Al	Black deposit	Test Conditions		
	Ti	Black deposit	Sample temperature, °F	410	
	Ag	Black deposit		Sample volume, ml	
	Steel	Black deposit		Air rate, liters/hr	
	Cu	L etching		Condensate return	
	Mg	Black deposit		Yes	

TEST NO. 377-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.48	—	3.25	0.21	
16 hr	14.62	8.5	3.43	0.88	
24 hr	14.82	9.9	3.45	1.25	
40 hr	15.52	15.1	3.57	2.06	
48 hr	17.03	26.3	3.78	5.38	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	—
	Steel	+0.10		Breakpoint Data	
	Cu	+0.66		Neut. no., hr to 1 mg KOH/g/8 hr	39
	Mg	0.00		100°F vis, hr to 1 cs/8 hr	45
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Test Conditions		
	Ti	L yellow	Sample temperature, °F	410	
	Ag	Tan		Sample volume, ml	
	Steel	Blue-green		Air rate, liters/hr	
	Cu	Brown deposit		Condensate return	
	Mg	No change		Yes	

TEST NO. 378-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-12 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.47	—	3.25	0.17	3
16 hr	14.45	7.3	3.41	0.81	
24 hr	14.61	8.5	3.43	0.96	
40 hr	14.92	10.8	3.48	1.23	
48 hr	15.11	12.2	3.52	1.99	

Metal Specimen Data				Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None	
	Ti	+0.08		Centrifuge, vol %	None	
	Ag	+0.06				
	Steel	-0.06		Tube deposits:	Total demerits	4
	Cu	-0.20				
	Mg	+0.04				
Metal discoloration, deposits, pitting, or etching:			Breakpoint Data			
			Neut. no., hr to 1 mg KOH/g/8 hr		46	
			100°F vis, hr to 1 cs/8 hr		48+	
			Test Conditions			
			Sample temperature, °F	401		
		Sample volume, ml	200			
		Air rate, liters/hr	10			
		Condensate return	Yes			

TEST NO. 378-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-14 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.35	—	3.32	0.14	3
16 hr	14.31	7.2	3.46	0.71	
24 hr	14.47	8.4	3.48	2.01	
40 hr	14.83	11.1	3.54	2.84	
48 hr	14.95	12.0	3.57	3.51	

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.00			
	Steel	0.00	Tube deposits:	Total demerits	15
	Cu	0.00			
	Mg	+0.06			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ag	Tan	100°F vis, hr to 1 cs/8 hr	48+	
	Steel	Peacock	Test Conditions		
	Cu	Gold	Sample temperature, °F	401	
	Mg	No change	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 378-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-15 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.90	—	3.11	0.13	5
16 hr	13.50	4.7	3.20	0.76	
24 hr	13.69	6.1	3.23	1.04	
40 hr	15.27	18.4	3.47	3.89	
48 hr	16.79	30.2	3.71	5.42	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	15
	Steel	-0.04		Breakpoint Data	
	Cu	-2.78		Neut. no., hr to 1 mg KOH/g/8 hr	27
Metal discoloration, deposits, pitting, or etching:	Mg	-0.02	100°F vis, hr to 1 cs/8 hr		36
			Test Conditions		
	Al	No change	Sample temperature, °F	401	
	Ti	No change	Sample volume, ml	200	
	Ag	No change	Air rate, liters/hr	10	
Steel	Blue-green	Condensate return	Yes		
Cu	M etching				
Mg	Gray				

TEST NO. 378-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-17 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.96	—	3.45	0.25	8
16 hr	12.99	0.2	3.41	2.32	
24 hr	13.14	1.4	3.42	4.94	
40 hr	16.32	25.9	3.85	19.49	
48 hr	18.49	42.7	4.22	26.0	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	11
	Steel	-0.08		Breakpoint Data	
	Cu	-0.70		Neut. no., hr to 1 mg KOH/g/8 hr	9
Metal discoloration, deposits, pitting, or etching:	Mg	-7.54	100°F vis, hr to 1 cs/8 hr		29
			Test Conditions		
	Al	No change	Sample temperature, °F	401	
	Ti	No change	Sample volume, ml	200	
	Ag	Tan	Air rate, liters/hr	10	
Steel	Brown	Condensate return	Yes		
Cu	L etching				
Mg	M etching & H pitting				

TEST NO. 379-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-896 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.93	—	3.59	0.32	6
16 hr	14.13	1.4	3.64	0.91	
24 hr	14.19	1.9	3.65	1.18	
40 hr	15.72	12.8	3.86	8.85	
48 hr	18.13	30.2	4.24	16.73	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	−0.06		Centrifuge, vol %	Trace
	Ag	−0.04	Tube deposits:	Total demerits	18
	Steel	+0.02			
	Cu	−0.40			
	Mg	−0.12	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	28	
			100°F vis, hr to 1 cs/8 hr	36	
			Test Conditions		
	Al	L brown	Sample temperature, °F	385	
	Ti	Purple	Sample volume, ml	200	
Ag	L yellow	Air rate, liters/hr	10		
Steel	Blue-green	Condensate return	Yes		
Cu	L etching				
Mg	L brown				

TEST NO. 379-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-898 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.82	—	3.59	0.32	6
16 hr	13.93	0.8	3.61	0.86	
24 hr	13.96	1.0	3.62	1.11	
40 hr	15.74	13.9	3.79	10.64	
48 hr	17.49	26.6	4.14	17.35	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	Trace
	Ag	0.00	Tube deposits:	Total demerits	30
	Steel	+0.04			
	Cu	-0.60			
	Mg	-0.36			
			Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		29
			100°F vis, hr to 1 cs/8 hr		34
			Test Conditions		
	Al	L brown	Sample temperature, °F	385	
	Ti	Pink	Sample volume, ml	200	
	Ag	L yellow	Air rate, liters/hr	10	
	Steel	Blue-green	Condensate return	Yes	
	Cu	L etching			
	Mg	L etching			

TEST NO. 379-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-899 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.08	—	3.67	0.34	
16 hr	14.19	0.8	3.68	0.91	
24 hr	14.22	1.0	3.69	1.28	
40 hr	16.15	14.7	4.02	12.26	
48 hr	17.73	25.9	4.19	18.04	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	0.00	Tube deposits:	Total demerits	32
	Steel	+0.06		Breakpoint Data	
	Cu	-1.06		Neut. no., hr to 1 mg KOH/g/8 hr	27
	Mg	-0.58		100°F vis, hr to 1 cs/8 hr	33
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Test Conditions		
	Ti	Pink	Sample temperature, °F	385	
	Ag	L yellow	Sample volume, ml	200	
	Steel	Blue-green	Air rate, liters/hr	10	
	Cu	L etching	Condensate return	Yes	
	Mg	L etching			

TEST NO. 380-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-13 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.63	—	3.58	0.18	
16 hr	14.91	1.9	3.61	0.42	
24 hr	14.96	2.3	3.61	0.76	
40 hr	15.06	2.9	3.64	1.13	
48 hr	15.11	3.3	3.64	1.18	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.12	Sludge in oil:	200-mesh filter	None
	Ti	0.08		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	31
	Steel	-0.02		Breakpoint Data	
	Cu	-0.08		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	0.00		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	385	
	Ag	Tan	Sample volume, ml	200	
	Steel	Pink	Air rate, liters/hr	10	
	Cu	Gold	Condensate return	Yes	
	Mg	No change			

TEST NO. 380-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON 65-L-114 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.53	—	3.54	0.10	4
16 hr	14.12	4.4	3.64	1.16	
24 hr	14.07	4.0	3.62	1.29	
40 hr	14.03	3.7	3.62	1.79	
48 hr	14.01	3.5	3.61	1.74	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.10	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	0.4
	Ag	+0.12	Tube deposits:	Total demerits	94
	Steel	−0.04			
	Cu	−0.08			
	Mg	−0.52	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L green & pink	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	Peacock		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Pink	Test Conditions		
	Steel	Blue, green, & pink	Sample temperature, °F	385	
	Cu	Orange	Sample volume, ml	200	
	Mg	± pitting & etching	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 380-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-897 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.70	—	3.57	0.32	4
16 hr	13.80	0.7	3.59	0.83	
24 hr	13.86	1.2	3.59	1.10	
40 hr	15.41	12.5	3.81	9.41	
48 hr	16.91	23.4	4.06	16.55	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.08	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	Trace
	Ag	+0.06	Tube deposits:	Total demerits	40
	Steel	−0.06			
	Cu	−1.36			
	Mg	−0.22	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Neut. no., hr to 1 mg KOH/g/8 hr	29	
	Ti	L purple		100°F vis, hr to 1 cs/8 hr	
	Ag	L yellow	Test Conditions		
	Steel	Blue-green	Sample temperature, °F	385	
	Cu	L etching	Sample volume, ml	200	
	Mg	L etching	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 381-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-12 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.47	-	3.25	0.17	3
16 hr	14.60	8.4	3.47	0.98	
24 hr	14.83	10.1	3.48	1.16	
40 hr	15.61	15.9	3.59	2.75	
48 hr	16.80	24.7	3.77	5.46	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	10
	Steel	0.00			
	Cu	-0.22			
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	36	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	45
	Ag	Gray	Test Conditions		
	Steel	Blue	Sample temperature, °F	410	
	Cu	L etching	Sample volume, ml	200	
	Mg	Gray	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 381-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-14 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.35	—	3.32	0.14	3
16 hr	14.44	8.2	3.49	1.83	
24 hr	14.68	10.0	3.51	2.47	
40 hr	15.19	13.8	3.61	3.67	
48 hr	15.52	16.3	3.65	4.97	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	None
	Ti	-0.04		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	12
	Steel	-0.06			
	Cu	+0.18			
	Mg	-0.06			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	43	
	Ag	Yellow	100°F vis, hr to 1 cs/8 hr	48+	
	Steel	Peacock	Test Conditions		
	Cu	Gold	Sample temperature, °F	410	
	Mg	Gray	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 382-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-69-1 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	28.62	-	5.34	0.45	
16 hr	32.91	15.0	5.87	1.03	
24 hr	33.82	18.2	5.99	0.99	
40 hr	35.97	29.2	6.29	2.24	
48 hr	40.21	40.5	6.72	4.25	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.08	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	71
	Steel	-0.06		Breakpoint Data	
	Cu	-0.22		Neut. no., hr to 1 mg KOH/g/8 hr	
Metal discoloration, deposits, pitting, or etching:	Mg	-	100°F vis, hr to 1 cs/8 hr		38
	Al	No change	Test Conditions		30
	Ti	No change	Sample temperature, °F		428
	Ag	L yellow	Sample volume, ml		200
	Steel	Blue	Air rate, liters/hr		10
	Cu	L etching & pitting	Condensate return		Yes
	Mg	-			

TEST NO. 382-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-69-1 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	28.62	-	5.34	0.45	
16 hr	32.90	15.0	5.87	0.98	
24 hr	33.78	18.0	5.98	1.18	
40 hr	36.11	26.2	6.16	1.96	
48 hr	38.26	33.7	6.54	4.16	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	66
	Steel	-0.06		Breakpoint Data	
	Cu	-0.28		Neut. no., hr to 1 mg KOH/g/8 hr	
Metal discoloration, deposits, pitting, or etching:	Mg	-	100°F vis, hr to 1 cs/8 hr		39
	Al	No change	Test Conditions		31
	Ti	No change	Sample temperature, °F		428
	Ag	L yellow	Sample volume, ml		200
	Steel	Blue	Air rate, liters/hr		10
	Cu	L etching & pitting	Condensate return		Yes
	Mg	-			

TEST NO. 383-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-13 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.63	—	3.58	0.18	5
16 hr	14.95	2.2	3.60	0.59	
24 hr	14.99	2.5	3.61	0.86	
40 hr	15.21	4.0	3.63	1.10	
48 hr	15.19	3.8	3.62	1.30	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	None
	Ti	+0.12		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	36
	Steel	+0.08		Breakpoint Data	
	Cu	-0.14		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	+0.20		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	392	
	Ag	Gray	Sample volume, ml	200	
	Steel	Violet	Air rate, liters/hr	10	
	Cu	Gold	Condensate return	Yes	
	Mg	No change			

TEST NO. 383-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-17 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.96	—	3.45	0.25	7
16 hr	12.97	0.1	3.42	1.64	
24 hr	13.02	0.5	3.45	2.09	
40 hr	14.87	14.7	3.63	13.35	
48 hr	16.91	30.5	3.94	21.4	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.10	Sludge in oil:	200-mesh filter	None
	Ti	+0.12		Centrifuge, vol %	None
	Ag	+0.12	Tube deposits:	Total demerits	6
	Steel	+0.16		Breakpoint Data	
	Cu	−0.36			
Mg	−3.14				
Metal discoloration, deposits, pitting, or etching:	Al	L blue	Neut. no., hr to 1 mg KOH/g/8 hr	26	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	33
	Ag	Tan	Test Conditions		
	Steel	Brown	Sample temperature, °F	392	
	Cu	L etching	Sample volume, ml	200	
Mg	L pitting & M etching	Air rate, liters/hr	10		
			Condensate return	Yes	

TEST NO. 383-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-891 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.95	—	3.34	0.16	2
16 hr	14.65	5.0	3.46	0.40	
24 hr	14.79	6.0	3.47	0.59	
40 hr	15.04	7.8	3.52	0.78	
48 hr	15.12	8.4	3.54	0.94	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.22	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.10		Centrifuge, vol %	None
	Ag	+0.14	Tube deposits:	Total demerits	13
	Steel	+0.06			
	Cu	0.00			
	Mg	+0.10	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	Pink	Sample volume, ml	200	
	Mg	L brown	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 384-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-8 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.34	—	3.26	0.23	5
16 hr	14.54	9.0	3.51	1.67	
24 hr	14.87	11.5	3.53	2.03	
40 hr	15.41	15.5	3.63	3.16	
48 hr	15.97	19.7	3.71	5.45	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.14	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.08		Centrifuge, vol %	Trace
	Ag	0.00	Tube deposits:	Total demerits	51
	Steel	+0.16			
	Cu	-0.18			
	Mg	+0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		38
	Ti	No change	100°F vis, hr to 1 cs/8 hr		48+
	Ag	L yellow	Test Conditions		
	Steel	Blue	Sample temperature, °F	410	
	Cu	Brown	Sample volume, ml	200	
	Mg	Brown	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 385-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-69-1 AT 464°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	28.62	—	5.34	0.45	7
16 hr	35.02	22.4	6.14	2.81	
24 hr	37.71	31.8	6.45	4.04	
40 hr	48.36	69.0	7.71	7.59	
48 hr	56.47	97.3	8.63	9.57	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.12		Centrifuge, vol %	None
	Ag	+0.10	Tube deposits:	Total demerits	69
	Steel	+0.10			
	Cu	−0.50			
	Mg	—	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	< 8	
			100°F vis, hr to 1 cs/8 hr	< 8	
			Test Conditions		
	Al	L brown	Sample temperature, °F	464	
	Ti	L brown	Sample volume, ml	200	
Ag	L brown	Air rate, liters/hr	10		
Steel	Green	Condensate return	Yes		
Cu	L etching				
Mg	—				

TEST NO. 385-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-69-1 AT 464°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	28.62	—	5.34	0.45	7
16 hr	35.30	23.3	6.17	2.56	
24 hr	38.73	35.3	6.56	4.43	
40 hr	52.79	84.5	8.17	7.73	
48 hr	63.71	123	9.40	15.79	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.08	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	80
	Steel	+0.20			
	Cu	−0.66			
	Mg	—	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	8	
	Ti	L brown		100°F vis, hr to 1 cs/8 hr	< 8
	Ag	L yellow	Test Conditions		
	Steel	Green	Sample temperature, °F	464	
	Cu	L etching	Sample volume, ml	200	
	Mg		Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 386-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-17 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.96	—	3.45	0.25	0
16 hr	14.08	8.6	3.43	0.82	
24 hr	14.27	10.1	3.46	0.72	
40 hr	14.58	12.5	3.50	1.93	
48 hr	14.70	13.4	3.53	2.15	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	−0.10	Tube deposits:	Total demerits	5
	Steel	0.00			
	Cu	+0.04			
	Mg	−0.04	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	No change	100°F vis, hr to 1 cs/8 hr		48+
	Ag	Tan	Test Conditions		
	Steel	Peacock	Sample temperature, °F	385	
	Cu	Gold	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 387-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.29	—	3.21	0.00	1
16 hr	14.19	6.8	3.35	0.62	
24 hr	14.35	8.0	3.38	0.68	
40 hr	14.58	9.7	3.42	1.05	
48 hr	14.77	11.1	3.44	1.28	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	None
	Ti	−0.02		Centrifuge, vol %	None
	Ag	−0.02	Tube deposits:	Total demerits	15
	Steel	+0.10			
	Cu	−0.12			
	Mg	+0.64	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		43+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	No change	Sample temperature, °F	401	
	Ti	L yellow	Sample volume, ml	200	
Ag	L yellow	Air rate, liters/hr	10		
Steel	Peacock	Condensate return	Yes		
Cu	Brown & L green				
Mg	No change				

TEST NO. 387-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1^(a) AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.29	—	3.21	0.00	2
16 hr	14.20	6.8	3.34	0.52	
24 hr	14.37	8.1	3.38	0.75	
40 hr	14.64	10.2	3.42	1.00	
48 hr	14.76	11.1	3.44	1.29	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.10	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	-0.06	Tube deposits:	Total demerits	12
	Steel	+0.10			
	Cu	-0.06			
Metal discoloration, deposits, pitting, or etching:	Mg	-0.02	Breakpoint Data		
	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
		Ti	L yellow	100°F vis, hr to 1 cs/8 hr	48+
		Ag	L yellow	Test Conditions	
		Steel	Blue & L green	Sample temperature, °F	401
	Cu	Brown & L green	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	
(a) 10 ppm powdered iron added to initial 200-ml sample.					

TEST NO. 387-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1^(a) AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.29	—	3.21	0.00	2
16 hr	14.20	6.8	3.34	0.50	
24 hr	14.35	8.0	3.37	0.68	
40 hr	14.62	10.0	3.42	0.92	
48 hr	14.73	10.8	3.44	1.35	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	18
	Steel	-0.02			
	Cu	-0.04			
	Mg	+0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Peacock	Sample temperature, °F	401	
		Cu	Brown & L green	Sample volume, ml	200
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	
(a) 40 ppm powdered iron added to initial 200-ml sample.					

TEST NO. 387-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1^(a) AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.29	—	3.21	0.00	3
16 hr	14.18	6.7	3.35	0.45	
24 hr	14.34	7.9	3.38	0.66	
40 hr	14.63	10.1	3.43	0.93	
48 hr	14.77	11.1	3.44	1.25	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	None
	Ti	-0.02		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	15
	Steel	+0.06		Breakpoint Data	
	Cu	-0.06		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	-0.02		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Test Conditions		
	Ti	L brown	Sample temperature, °F	401	
	Ag	L brown		Sample volume, ml	
	Steel	Blue & L green		Air rate, liters/hr	
	Cu	Brown & L green		Condensate return	
	Mg	No change		Yes	
(a) 80 ppm powdered iron added to initial 200-ml sample.					

TEST NO. 387-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-13 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.63	—	3.58	0.18	
16 hr	14.94	2.1	3.60	1.30	
24 hr	15.04	2.8	3.61	1.46	
40 hr	15.53	6.2	3.65	3.84	
48 hr	16.25	11.1	3.75	7.67	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	-0.08	Tube deposits:	Total demerits	98
	Steel	0.00		Breakpoint Data	
	Cu	-2.96		Neut. no., hr to 1 mg KOH/g/8 hr	32
	Mg	0.00		100°F vis, hr to 1 cs/8 hr	47
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Test Conditions		
	Ti	No change	Sample temperature, °F	401	
	Ag	Gray		Sample volume, ml	
	Steel	Purple		Air rate, liters/hr	
	Cu	M pitting & L etching		Condensate return	
	Mg	L yellow		Yes	

TEST NO. 388-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-14 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.35	-	3.32	0.14	13
16 hr	13.31	-0.03	3.40	5.67	
24 hr	15.45	+15.7	3.70	6.10	
40 hr	26.64	+99.6	5.87	26.0	
48 hr	162.8	+1119	28.25	32.9	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	0.2
	Ag	-0.08	Tube deposits:	Total demerits	144
	Steel	+0.06			
	Cu	-1.04			
	Mg	-35.0	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Neut. no., hr to 1 mg KOH/g/8 hr	27	
	Ti	L yellow		100°F vis, hr to 1 cs/8 hr	16
	Ag	Tan	Test Conditions		
	Steel	Brown	Sample temperature, °F	419	
	Cu	L pitting & etching	Sample volume, ml	200	
	Mg	67% destroyed	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 389-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-814 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.45	—	3.37	0.23	5
16 hr	14.32	6.5	3.51	0.68	
24 hr	14.56	8.3	3.55	1.14	
40 hr	17.79	32.3	4.01	9.67	
48 hr	19.47	44.8	4.28	14.20	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	−0.02		Centrifuge, vol %	0.6
	Ag	+0.06	Tube deposits:	Total demerits	26
	Steel	0.00			
	Cu	−0.98			
	Mg	−0.50	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no , hr to 1 mg KOH/g/8 hr		27
			100°F vis, hr to 1 cs/8 hr		27
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	L yellow	Sample volume, ml	200	
	Ag	Tan	Air rate, liters/hr	10	
	Steel	Blue & pink	Condensate return	Yes	
	Cu	M etching			
	Mg	L pitting			

TEST NO. 389-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-896 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.93	—	3.59	0.32	
16 hr	14.18	1.8	3.62	1.17	
24 hr	14.30	2.7	3.64	1.99	
40 hr	16.90	21.3	4.04	13.49	
48 hr	18.90	35.7	4.36	17.38	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² : Al +0.10 Ti +0.02 Ag 0.00 Steel -0.12 Cu -0.80 Mg -0.62 Metal discoloration, deposits, pitting, or etching: Al L brown Ti Yellow & purple Ag L brown Steel Blue & green Cu L etching Mg L pitting			Sludge in oil: 200-mesh filter	L trace	
			Centrifuge, vol %	Trace	
			Tube deposits: Total demerits	24	
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr	23	
			100°F vis, hr to 1 cs/8 hr	30	
			Test Conditions		
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 389-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-897 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.70	—	3.57	0.32	
16 hr	13.90	1.5	3.62	1.23	
24 hr	13.98	2.0	3.62	1.65	
40 hr	16.57	20.9	4.00	14.41	
48 hr	18.28	33.4	4.29	18.55	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² : Al -0.18 Ti -0.04 Ag -0.06 Steel 0.00 Cu -2.08 Mg -0.82 Metal discoloration, deposits, pitting, or etching: Al L brown Ti Yellow & purple Ag L brown Steel Blue & green Cu L etching Mg L etching			Sludge in oil: 200-mesh filter	None	
			Centrifuge, vol %	Trace	
			Tube deposits: Total demerits	24	
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr	26	
			100°F vis, hr to 1 cs/8 hr	29	
			Test Conditions		
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liter./hr	10	
			Condensate return	Yes	

TEST NO. 389-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-898 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.82		3.59	0.32	
16 hr	13.96	1.0	3.62	1.09	
24 hr	14.16	2.5	3.64	2.48	
40 hr	16.80	21.6	4.03	13.87	
48 hr	17.65	27.7	4.32	20.2	5

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.18	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	Trace
	Ag	+0.04	Tube deposits:	Total deposits	21
	Steel	+0.10			
	Cu	-0.44			
	Mg	-1.28	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Neut. no., hr to 1 mg KOH/g/8 hr	18	
	Ti	Pink		100°F vis, hr to 1 cs/8 hr	24
	Ag	L brown	Test Conditions		
	Steel	Blue & green	Sample temperature, °F	392	
	Cu	L etching	Sample volume, ml	200	
	Mg	L etching & pitting	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 389-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-899 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.08	—	3.67	0.34	5
16 hr	14.26	1.3	3.69	1.22	
24 hr	14.45	2.6	3.72	3.09	
40 hr	17.09	21.4	4.08	15.16	
48 hr	18.75	33.2	4.38	20.4	

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	-0.02		Centrifuge, vol %	Trace
	Ag	+0.02	Tube deposits:	Total demerits	29
	Steel	+0.02			
	Cu	-1.22			
	Mg	-0.90			
Metal discoloration, deposits, pitting, or etching:			Breakpoint Data		
			No., hr to 1 mg KOH/g/8 hr		15
			No., hr to 1 cs/8 hr		29
			Test Conditions		
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 389-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-900 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	30.93	—	5.54	0.65	4
16 hr	32.60	5.4	5.75	1.04	
24 hr	33.08	7.0	5.82	1.12	
40 hr	34.02	10.0	5.92	0.92	
48 hr	34.64	12.0	6.00	1.12	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.14		Centrifuge, vol %	None
	Ag	−0.02	Tube deposits:	Total demerits	2
	Steel	0.00			
	Cu	−1.06			
	Mg	+0.04	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	No change	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	L etching	Sample volume, ml	200	
	Mg	L blue	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 390-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-886 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.51	—	3.30	0.22	3
16 hr	14.28	5.7	3.45	0.47	
24 hr	14.47	7.1	3.47	0.64	
40 hr	14.65	8.4	3.49	0.90	
48 hr	14.74	9.1	3.52	1.04	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.04		Centrifuge, vol %	0.2
	Ag	−0.14	Tube deposits:	Total demerits	32
	Steel	+0.04			
	Cu	−0.10			
	Mg	0.00	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	No change	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	Violet	Sample volume, ml	200	
	Mg	Brown	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 390-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-901 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.67	—	3.29	0.30	2
16 hr	14.34	4.9	3.40	0.45	
24 hr	14.48	5.9	3.42	0.63	
40 hr	14.66	7.2	3.45	0.86	
48 hr	14.77	8.0	3.46	0.92	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.12	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.04		Centrifuge, vol %	Trace
	Ag	+0.06	Tube deposits:	Total demerits	43
	Steel	+0.04			
	Cu	-0.02			
	Mg	0.00	Breakpoint Data		
Metal discoloration, deposit., pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	No change	100°F vis, hr to 1 cs/8 hr		48+
	Ag	No change	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	Pink	Sample volume, ml	200	
	Mg	L blue	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 390-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-902 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.55	—	3.27	0.18	3
16 hr	14.42	6.4	3.41	0.37	
24 hr	14.55	7.4	3.43	0.54	
40 hr	14.75	8.9	3.46	0.79	
48 hr	14.82	9.4	3.48	0.81	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.08	Sludge in oil:	200-mesh filter	None
	Ti	−0.04		Centrifuge, vol %	Trace
	Ag	+0.04	Tube deposits:	Total demerits	10
	Steel	0.00			
	Cu	−0.06			
	Mg	−0.10	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	392	
	Ag	L yellow	Sample volume, ml	200	
Steel	Blue	Air rate, liters/hr	10		
Cu	Green	Condensate return	Yes		
	Mg	Brown			

TEST NO. 391-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-21-68 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	27.60	—	5.06	0.15	4
16 hr	30.25	9.5	5.38	0.29	
24 hr	30.85	11.8	5.45	0.35	
40 hr	31.70	14.9	5.56	0.40	
48 hr	31.95	15.9	5.60	0.44	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	-0.06		Centrifuge, vol %	None
	Ag	-0.06	Tube deposits:	Total demerits	1
	Steel	+0.12			
	Cu	-0.06			
Metal discoloration, deposits, pitting, or etching:	Mg	-0.02	Breakpoint Data		
	Al Ti Ag Steel Cu Mg	No change No change Yellow Blue Pink No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
			Sample temperature, °F	392	
	Sample volume, ml	200			
	Air rate, liters/hr	10			
	Condensate return	Yes			

TEST NO. 391-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-22-68 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.91	—	4.29	0.12	4
16 hr	17.05	+0.8	4.28	1.56	
24 hr	16.90	—0.1	4.21	1.93	
40 hr	16.76	—0.9	4.06	8.11	
48 hr	18.55	+9.7	4.31	14.45	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.10	Sludge in oil:	200-mesh filter	None
	Ti	—0.02		Centrifuge, vol %	Trace
	Ag	—0.08	Tube deposits:	Total demerits	58
	Steel	+0.02			
	Cu	—0.26			
	Mg	+0.02			
Metal discoloration, deposits, pitting, or etching:	Al	L green	Neut. no., hr to 1 mg KOH/g/8 hr	28	
	Ti	L green		100°F vis, hr to 1 cs/8 hr	41
	Ag	L green	Test Conditions		
	Steel	Yellow			
	Cu	L etching		Sample temperature, °F	392
	Mg	Tan		Sample volume, ml	200
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 391-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-23-68 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	13.55	—	3.26	0.16	2	
16 hr	14.32	5.7	3.39	0.48		
24 hr	14.51	7.1	3.41	0.70		
40 hr	14.77	9.0	3.46	0.82		
48 hr	14.83	9.4	3.48	1.02		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	Trace	
	Ti	−0.04		Centrifuge, vol %	None	
	Ag	−0.10		Tube deposits:	Total demerits	4
	Steel	+0.02				
	Cu	−0.02				
Mg	+0.04					
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+		
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+	
	Ag	L brown	Breakpoint Data			
	Steel	Blue	Test Conditions			
	Cu	Brown	Sample temperature, °F	392		
Mg	No change	Sample volume, ml	200			
		Air rate, liters/hr	10			
		Condensate return	Yes			

TEST NO. 391-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-24-68 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	27.27	—	5.45	0.18	7	
16 hr	29.14	6.9	5.53	1.32		
24 hr	30.09	10.3	5.60	1.71		
40 hr	33.64	23.4	5.99	1.08		
48 hr	36.16	32.6	6.30	0.88		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None	
	Ti	−0.04		Centrifuge, vol %	None	
	Ag	−0.02		Tube deposits:	Total demerits	12
	Steel	+0.10				
	Cu	−6.86				
	Mg	−0.08	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+		
	Ti	No change		100°F vis, hr to 1 cs/8 hr	23	
	Ag	No change	Test Conditions			
	Steel	Blue	Sample temperature, °F	392		
		Cu	H etching	Sample volume, ml	200	
	Mg	L brown	Air rate, liters/hr	10		
			Condensate return	Yes		

TEST NO. 391-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-25-68 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	25.99	—	5.04	0.19	4
16 hr	28.07	8.0	5.29	0.45	
24 hr	28.56	9.9	5.36	0.54	
40 hr	29.27	12.6	5.45	0.80	
48 hr	29.48	13.4	5.50	0.82	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	−0.02		Centrifuge, vol %	None
	Ag	−0.06	Tube deposits:	Total demerits	6
	Steel	+0.02		Breakpoint Data	
	Cu	+0.06		Neut. no., hr to 1 mg KOH/g/8 hr	48+
Mg	−0.02	100°F vis, hr to 1 cs/8 hr	48+		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	392	
	Ag	Tan	Sample volume, ml	200	
	Steel	L green	Air rate, liters/hr	10	
	Cu	Gold	Condensate return	Yes	
	Mg	No change			

TEST NO. 391-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-26-68 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.39	—	3.19	2.54	4
16 hr	12.81	3.4	3.25	3.77	
24 hr	12.91	4.2	3.29	3.55	
40 hr	13.06	5.4	3.30	4.83	
48 hr	13.07	5.5	3.32	6.59	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.18	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.14		Centrifuge, vol %	1.0
	Ag	+0.18	Tube deposits:	Total demerits	247
	Steel	+0.22		Breakpoint Data	
	Cu	-0.12		Neut. no., hr to 1 mg KOH/g/8 hr	38
Metal discoloration, deposits, pitting, or etching:	Mg	+0.08	100°F vis, hr to 1 cs/8 hr		48+
	Al	Brown	Test Conditions		
	Ti	Brown	Sample temperature, °F	392	
	Ag	Brown	Sample volume, ml	200	
	Steel	Brown deposit	Air rate, liters/hr	10	
	Cu	Brown	Condensate return	Yes	
	Mg	Brown			

TEST NO. 392-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-25 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	28.58	~	5.45	0.00	4	
16 hr	30.76	7.6	5.59	0.42		
24 hr	31.30	9.5	5.66	0.53		
40 hr	32.50	13.7	5.82	0.85		
48 hr	34.90	22.1	6.06	2.56		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	Trace	
	Ti	+0.02		Centrifuge, vol %	None	
	Ag	+0.04	Tube deposits:	Total demerits	39	
	Steel	+0.06				
	Cu	-0.30				
	Mg	+0.06	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	41		
				100°F vis, hr to 1 cs/8 hr	37	
			Test Conditions			
			Sample temperature, °F	419		
			Sample volume, ml	200		
		Air rate, liters/hr	10			
		Condensate return	Yes			

TEST NO. 392-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-15 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	27.20	—	5.04	0.02	4
16 hr	30.94	13.7	5.50	0.86	
24 hr	31.82	17.0	5.60	1.18	
40 hr	33.79	24.2	5.83	1.97	
48 hr	35.20	29.4	6.00	2.14	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	8
	Steel	+0.06			
	Cu	−0.32			
	Mg	+0.10	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		32
			Test Conditions		
	Al	No change	Sample temperature, °F	419	
	Ti	No change	Sample volume, ml	200	
	Ag	L Yellow	Air rate, liters/hr	10	
	Steel	Yellow	Condensate return	Yes	
	Cu	L etching			
	Mg	L brown			

TEST NO. 392-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-16 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	26.69	—	5.13	0.20	4
16 hr	30.37	13.8	5.56	1.30	
24 hr	31.15	16.7	5.66	1.40	
40 hr	33.19	24.4	5.91	2.41	
48 hr	35.40	32.6	6.15	4.19	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	−0.16	Tube deposits:	Total demerits	19
	Steel	+0.08			
	Cu	+0.02			
	Mg	+0.08	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		39
	Ti	No change	100°F vis, hr to 1 cs/8 hr		33
	Ag	Tan	Test Conditions		
	Steel	L yellow	Sample temperature, °F	419	
	Cu	Gold	Sample volume, ml	200	
	Mg	L brown	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 392-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.48	—	3.25	0.21	5
16 hr	14.81	9.9	3.46	1.21	
24 hr	15.23	13.0	3.53	2.24	
40 hr	17.55	30.2	3.85	7.35	
48 hr	19.87	47.4	4.19	9.44	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil: 200-mesh filter	Trace	None
	Ti	−0.06			
	Ag	+0.06	Tube deposits: Total demerits	26	
	Steel	−0.06			
	Cu	−0.34			
	Mg	−0.68	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Neut. no., hr to 1 mg KOH/g/8 hr		20
	Ti	Brown	100°F vis, hr to 1 cs/8 hr		31
	Ag	Tan	Test Conditions		
	Steel	L blue	Sample temperature, °F	419	
	Cu	L etching	Sample volume, ml	200	
	Mg	L etching & pitting	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 392-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-9 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	28.16	—	5.31	0.16	4
16 hr	31.42	11.8	5.72	0.65	
24 hr	31.97	13.5	5.78	0.78	
40 hr	33.03	17.3	5.94	0.95	
48 hr	33.62	19.4	6.00	0.97	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.06	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	−0.04	Tube deposits:	Total demerits	16
	Steel	+0.02			
	Cu	−0.12			
	Mg	+0.08	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	48+	
			100°F vis, hr to 1 cs/8 hr	48+	
	Al	L brown	Test Conditions		
	Ti	Brown	Sample temperature, °F	419	
	Ag	L yellow	Sample volume, ml	200	
Steel	L green	Air rate, liters/hr	10		
Cu	Gold	Condensate return	Yes		
	Mg	Gray			

TEST NO. 393-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-25 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	28.58	—	5.45	0.00	11
7 days	30.77	7.7	5.61	0.19	
14 days	31.37	9.8	5.69	0.27	
21 days	31.86	11.5	5.75	0.26	
26 days	31.78	11.2	5.75	0.21	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	None
	Ag	-0.02	Tube deposits:	Total demerits	1
	Steel	+0.10			
	Cu	+0.12			
	Mg	+0.02			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., days to 1 mg KOH/g/4 days		26+
	Ag	L yellow	100°F vis, days to 1 cs/4 days		26+
	Steel	Peacock	Test Conditions		
	Cu	Brown	Sample temperature, °F	347	
	Mg	No change	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 393-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-15 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	27.20	—	5.04	0.02	10
7 days	30.83	13.3	5.51	0.30	
14 days	31.78	16.8	5.64	0.42	
21 days	32.69	20.2	5.75	0.62	
26 days	32.96	21.2	5.79	0.78	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.10		Centrifuge, vol %	None
	Ag	-0.04	Tube deposits:	Total demerits	5
	Steel	0.00		Breakpoint Data	
	Cu	-0.22		Neut. no., days to 1 mg KOH/g/4 days	26+
	Mg	-0.10		100°F vis, days to 1 cs/4 days	26+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	347	
	Ag	Brown	Sample volume, ml	200	
	Steel	Peacock	Air rate, liters/hr	10	
	Cu	L etching	Condensate return	Yes	
	Mg	Gray			

TEST NO. 393-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-16 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	26.69	—	5.13	0.20	10
7 days	30.07	12.7	5.56	0.45	
14 days	30.89	15.7	5.67	0.58	
21 days	31.63	18.5	5.77	0.64	
26 days	31.75	19.0	5.79	0.56	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² : Al 0.00 Ti +0.06 Ag 0.00 Steel +0.02 Cu +0.10 Mg +0.02			Sludge in oil:	200-mesh filter Centrifuge, vol %	None None
			Tube deposits:	Total demerits	4
			Breakpoint Data		
			Neut. no., days to 1 mg KOH/g/4 days	26+	
			100°F vis, days to 1 cs/4 days	26+	
Metal discoloration, deposits, pitting, or etching: Al No change Ti L yellow Ag L yellow Steel Blue-green Cu Gold Mg No change			Test Conditions		
			Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 393-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.48	—	3.25	0.21	9
7 days	14.75	9.4	3.47	0.47	
14 days	15.10	12.0	3.53	0.47	
21 days	15.51	15.1	3.59	0.67	
26 days	15.53	15.2	3.59	0.85	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.10	Tube deposits:	Total demerits	17
	Steel	-0.06			
	Cu	-0.18			
	Mg	+0.18	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Neut. no., days to 1 mg KOH/g/4 days	26+	
	Ti	Brown		100°F vis, days to 1 cs/4 days	26+
	Ag	Tan	Test Conditions		
	Steel	Peacock	Sample temperature, °F	347	
	Cu	Brown	Sample volume, ml	200	
	Mg	Gray	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 393-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-9 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	28.16	—	5.31	0.16	11
7 days	31.55	12.0	5.76	0.39	
14 days	32.17	14.2	5.84	0.39	
21 days	32.81	16.5	5.92	0.42	
26 days	32.87	16.7	5.93	0.33	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	-0.12	Tube deposits:	Total demerits	< 10 ^(a)
	Steel	-0.10			
	Cu	+0.06			
	Mg	+0.08			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	L yellow	Neut. no., days to 1 mg KOH/g/4 days	26+	
	Ag	Tan			100°F vis, days to 1 cs/4 days
	Steel	Blue & gold	Test Conditions		
	Cu	Gold		Sample temperature, °F	347
	Mg	No change		Sample volume, ml	200
		Air rate, liters/hr	10		
		Condensate return	Yes		
(a) Demerit rating not obtained—cell lost in handling.					

(a) Demerit rating not obtained—cell lost in handling.

TEST NO. 393-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON L-1136A^(a) AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.11	—	4.14	0.15	10
7 days	15.85	-1.6	4.02	1.06	
14 days	15.52	-3.7	3.88	2.15	
21 days	15.59	-3.2	3.84	4.96	
26 days	16.05	-0.4	3.92	5.35	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	Trace
	Ag	-0.02	Tube deposits:	Total demerits	46
	Steel	+0.02			
	Cu	-0.08			
	Mg	+0.20	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L green	Neut. no., days to 1 mg KOH/g/4 days	14	
	Ti	Green		100°F vis, days to 1 cs/4 days	26+
	Ag	Tan	Test Conditions		
	Steel	Green-yellow	Sample temperature, °F	347	
		Cu	Peacock	Sample volume, ml	200
	Mg	L brown deposit	Air rate, liters/hr	10	
			Condensate return	Yes	
(a) Blend (1:1) of O-67-7 and O-67-9.					

TEST NO. 394-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-22-68 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.91	—	4.29	0.12	2
16 hr	17.08	+1.0	4.30	1.41	
24 hr	16.94	+0.2	4.25	1.63	
40 hr	16.69	-1.3	4.19	2.46	
48 hr	16.44	-2.8	4.01	5.86	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.18		Centrifuge, vol %	Trace
	Ag	+0.18	Tube deposits:	Total demerits	45
	Steel	+0.12			
	Cu	-0.24			
	Mg	+0.04	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Neut. no., hr to 1 mg KOH/g/8 hr	39	
	Ti	L green		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Green	Sample temperature, °F	385	
		Cu	L etching	Sample volume, ml	200
	Mg	Gray	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 395-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ALO-839-F617948 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	14.02	—	3.51	0.19	2	
16 hr	14.38	2.6	3.56	1.03		
24 hr	14.38	2.6	3.56	1.18		
40 hr	14.50	3.4	3.56	1.72		
48 hr	14.53	3.6	3.59	2.95		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	−0.02	Sludge in oil:	200-mesh filter	None	
	Ti	0.00		Centrifuge, vol %	Trace	
	Ag	+0.08	Tube deposits:	Total demerits	9	
	Steel	+0.12				
	Cu	−0.24				
	Mg	+0.04	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	45		
				100°F vis, hr to 1 cs/8 hr	48+	
	Al	L yellow	Test Conditions			
	Ti	Brown	Sample temperature, °F	392		
	Ag	Yellow		Sample volume, ml	200	
Steel	Blue	Air rate, liters/hr			10	
Cu	L etching				Condensate return	Yes
Mg	L brown					

TEST NO. 396-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-21-68 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	27.60	—	5.06	0.15	4
16 hr	30.73	11.3	5.44	0.62	
24 hr	31.23	13.2	5.50	0.40	
40 hr	32.17	16.6	5.60	0.52	
48 hr	32.62	18.2	5.68	0.53	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.08		Centrifuge, vol %	None
	Ag	+0.10	Tube deposits:	Total demerits	0
	Steel	+0.06			
	Cu	−0.12			
	Mg	+0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, : etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Yellow	Test Conditions		
	Steel	Blue	Sample temperature, °F	401	
	Cu	Gold	Sample volume, ml	200	
Mg	No change	Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 396-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-23-68 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.55	—	3.26	0.16	2
16 hr	14.43	6.5	3.41	0.66	
24 hr	14.58	7.6	3.43	0.32	
40 hr	14.95	10.3	3.50	1.19	
48 hr	15.03	10.9	3.53	1.55	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.08	Sludge in oil:	200-mesh filter	Trace
	Ti	−0.02		Centrifuge, vol %	None
	Ag	−0.02	Tube deposits:	Total demerits	9
	Steel	0.00			
	Cu	−0.14			
	Mg	+0.16	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	No change	100°F vis, hr to 1 cs/8 hr		48+
	Ag	L yellow	Test Conditions		
	Steel	Blue	Sample temperature, °F	401	
	Cu	Brown	Sample volume, ml	200	
	Mg	L brown	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 396-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-24-68 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	7.27	—	5.45	0.18	6
16 hr	.47	8.1	5.55	1.62	
24 hr	31.10	14.0	5.70	1.78	
40 hr	35.54	30.3	6.21	1.49	
48 hr	38.35	40.6	6.53	2.30	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	None
	Ti	+0.08		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	10
	Steel	+0.08			
	Cu	-7.16			
	Mg	-0.52	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	46	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	<16
	Ag	No change	Test Conditions		
	Steel	Blue	Sample temperature, °F	401	
	Cu	H etching	Sample volume, ml	200	
	Mg	L etching & pitting	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 396-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-25-68 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	25.99	—	5.04	0.19	4
16 hr	28.45	9.5	5.35	0.65	
24 hr	28.98	11.5	5.41	0.67	
40 hr	29.85	14.9	5.53	0.88	
48 hr	30.35	16.8	5.60	0.90	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.10	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	+0.08	Tube deposits:	Total demerits	2
	Steel	+0.10		Breakpoint Data	
	Cu	+0.02		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	+0.06		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	401	
	Ag	Yellow	Sample volume, ml	200	
	Steel	Brown	Air rate, liters/hr	10	
	Cu	Gold	Condensate return	Yes	
	Mg	No change			

TEST NO. 396-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-26-68 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.39	—	3.19	2.54	4
16 hr	12.96	4.6	3.29	3.93	
24 hr	13.08	5.6	3.30	4.69	
40 hr	14.40	16.2	3.52	12.83	
48 hr	16.67	34.5	3.83	18.92	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.44	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.42		Centrifuge, vol %	Trace
	Ag	+0.30	Tube deposits:	Total demerits	299
	Steel	+0.26			
	Cu	-0.20			
Mg	+0.34	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching:	Al	Brown deposit	Neut. no., hr to 1 mg KOH/g/8 hr	23	
	Ti	Brown deposit		100°F vis, hr to 1 cs/8 hr	
	Ag	Brown deposit	Test Conditions		
	Steel	Brown deposit	Sample temperature, °F	401	
	Cu	L pitting	Sample volume, ml	200	
Mg	Brown deposit	Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 397-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-22-68 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.91	—	4.29	0.12	4
16 hr	17.15	1.4	4.31	1.11	
24 hr	17.17	1.5	4.31	1.31	
40 hr	17.09	1.1	4.29	1.65	
48 hr	17.00	0.5	4.27	1.90	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	Non?
	Ti	−0.10		Centrifuge, vol %	None
	Ag	−0.02	Tube deposits:	Total demerits	35
	Steel	−0.02			
	Cu	−0.28			
	Mg	−0.04	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
	Test Conditions				
	Al	Gray	Sample temperature, °F	374	
	Ti	L blue	Sample volume, ml	200	
Ag	L yellow	Air rate, liters/hr	10		
Steel	Purple	Condensate return	Yes		
Cu	L etching				
Mg	Gray				

TEST NO. 398-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.48	—	3.25	0.21	3
16 hr	14.59	8.2	3.40	0.89	
24 hr	14.84	10.1	3.47	1.14	
40 hr	15.42	14.4	3.57	2.08	
48 hr	16.20	20.2	3.68	3.66	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	
	Ag	−0.04	Tube deposits:	Total demerits	19
	Steel	+0.04			
	Cu	−0.34			
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr	44	
	Ag	Tan	100°F vis, hr to 1 cs/8 hr	46	
	Steel	Blue	Test Conditions		
	Cu	L etching	Sample temperature, °F	410	
	Mg	No change	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 398-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-21-68 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	27.60	—	5.06	0.15	4
16 hr	31.05	12.5	5.47	0.47	
24 hr	31.63	14.6	5.53	0.57	
40 hr	32.62	18.2	5.66	0.73	
48 hr	33.11	20.0	5.74	0.77	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.10	Sludge in oil:	200-mesh filter	None
	Ti	-0.04		Centrifuge, vol %	None
	Ag	+0.06	Tube deposits:	Total demerits	8
	Steel	+0.04			
	Cu	-0.14			
	Mg	-0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	No change	Sample temperature, °F	410	
	Ti	No change	Sample volume, ml	200	
Ag	Yellow	Air rate, liters/hr	10		
Steel	Blue	Condensate return	Yes		
Cu	Gold				
Mg	No change				

TEST NO. 398-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-23-68 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.55	—	3.26	0.16	4
16 hr	14.60	7.7	3.42	0.86	
24 hr	14.82	9.4	3.46	1.22	
40 hr	15.42	13.8	3.56	2.00	
48 hr	16.30	20.3	3.68	4.21	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.04		Centrifuge, vol %	
	Ag	+0.10	Tube deposits:	Total demerits	12
	Steel	+0.04			
	Cu	-0.24			
	Mg	-0.06			
Metal discoloration, deposits, pitting, or etching:			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr		39
			100°F vis, hr to 1 cs/8 hr		46
			Test Conditions		
	Al	No change	Sample temperature, °F		410
	Ti	No change	Sample volume, ml		200
Ag	Tan	Air rate, liters/hr		10	
Steel	Blue	Condensate return		Yes	
Cu	L etching				
Mg	No change				

TEST NO. 398-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-25-68 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	25.99	—	5.04	0.19	5
16 hr	28.78	10.7	5.39	0.65	
24 hr	29.50	13.5	5.49	0.79	
40 hr	30.48	17.3	5.61	1.03	
48 hr	31.11	20.0	5.69	1.05	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.10	Sludge in oil:	200-mesh filter	None
	Ti	-0.04		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	6
	Steel	0.00			
	Cu	+0.06			
	Mg	-0.08	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	No change	Sample temperature, °F	410	
	Ti	Brown	Sample volume, ml	200	
Ag	L brown	Air rate, liters/hr	10		
Steel	Feacock	Condensate return	Yes		
Cu	Gold				
Mg	No change				

TEST NO. 399-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-21-68 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	27.60	—	5.06	0.15	4	
16 hr	31.30	13.4	5.51	0.60		
24 hr	32.13	16.4	5.60	0.77		
40 hr	33.67	22.0	5.76	1.12		
48 hr	34.61	25.4	5.88	1.62		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None	
	Ti	+0.06		Centrifuge, vol %	None	
	Ag	+0.06	Tube deposits:	Total demerits	10	
	Steel	-0.02				
	Cu	-0.16				
	Mg	-0.02				
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+		
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+	
	Ag	L yellow	Test Conditions			
	Steel	Blue-green	Sample temperature, °F	419		
	Cu	Gold		Sample volume, ml	200	
	Mg	No change			Air rate, liters/hr	10
			Condensate return	Yes		

TEST NO. 399-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-25-68 AT 419°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	25.99	—	5.04	0.19	
16 hr	29.11	12.0	5.43	0.99	
24 hr	29.81	14.7	5.51	1.23	
40 hr	31.60	21.6	5.72	2.06	
48 hr	33.60	29.3	5.93	3.38	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	None
	Ag	-0.04	Tube deposits:	Total demerits	21
	Steel	0.00		Breakpoint Data	
	Cu	-0.02		Neut. no., hr to 1 mg KOH/g/8 hr	45
Metal discoloration, deposits, pitting, or etching:	Mg	+0.04	100°F vis, hr to 1 cs/8 hr		37
	Al	No change	Test Conditions		
	Ti	Brown	Sample temperature, °F	419	
	Ag	Yellow	Sample volume, ml	200	
	Steel	Blue & brown	Air rate, liters/hr	10	
	Cu	Gold	Condensate return	Yes	
	Mg	No change			

TEST NO. 400-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-21-68 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	27.60	—	5.06	0.15	5
16 hr	31.85	15.4	5.57	0.79	
24 hr	32.81	18.9	5.68	1.08	
40 hr	35.31	27.9	5.96	2.05	
48 hr	37.53	36.0	6.20	3.46	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.14	Sludge in oil:	200-mesh filter	None
	Ti	-0.02		Centrifuge, vol %	None
	Ag	-0.10	Tube deposits:	Total demerits	15
	Steel	0.00		Breakpoint Data	
	Cu	-0.22		Neut. no., hr to 1 mg KOH/g/8 hr	41
Metal discoloration, deposits, pitting, or etching:	Mg	-0.02	100°F vis, hr to 1 cs/8 hr		29
	Al	No change	Test Conditions		
	Ti	L brown	Sample temperature, °F	428	
	Ag	L yellow	Sample volume, ml	200	
	Steel	Blue-green	Air rate, liters/hr	10	
	Cu	L etching	Condensate return	Yes	
	Mg	Gray spots			

TEST NO. 400-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-25-68 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	25.99	—	5.04	0.19	5
16 hr	29.63	14.0	5.49	1.33	
24 hr	30.70	18.1	5.62	1.81	
40 hr	34.72	33.6	6.08	5.05	
48 hr	38.27	47.2	6.48	6.26	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil:	200-mesh filter	None
	Ti	−0.06		Centrifuge, vol %	None
	Ag	+0.14	Tube deposits:	Total demerits	23
	Steel	0.00		Breakpoint Data	
	Cu	−0.14		Neut. no., hr to 1 mg KOH/g/8 hr	24
	Mg	−0.08		100°F vis, hr to 1 cs/8 hr	29
Metal discoloration, deposits, pitting, or etching:	Al	1 brown	Test Conditions		
	Ti	Brown	Sample temperature, °F	428	
	Ag	Yellow		Sample volume, ml	200
	Steel	Peacock		Air rate, liters/hr	10
	Cu	Gold		Condensate return	Yes
	Mg	Gray spots			

TEST NO. 400-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-21-68^(a) AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	27.60	—	5.06	0.15	5
16 hr	31.86	15.4	5.56	0.81	
24 hr	32.88	19.1	5.69	1.10	
40 hr	35.33	28.0	5.96	2.00	
48 hr	37.12	34.5	6.15	3.48	

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.10	Sludge in oil:	200-mesh filter	None
	Ti	+0.08		Centrifuge, vol %	None
	Ag	-0.04	Tube deposits:	Total demerits	16
	Steel	+0.02		Breakpoint Data	
	Cu	-0.20		Neut. no., hr to 1 mg KOH/g/8 hr	44
Metal discoloration, deposits, pitting, or etching:	Mg	-0.14	100°F vis, hr to 1 cs/8 hr	29	
	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	428	
	Ag	L yellow	Sample volume, ml	200	
	Steel	Blue-green	Air rate, liters/hr	10	
Cu	L etching	Condensate return	Yes		
Mg	Gray spots				

(a) Evaluated in aluminum block.

TEST NO. 400-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-25-68^(a) AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	25.99	—	5.04	0.19	5	
16 hr	29.58	13.8	5.49	1.41		
24 hr	30.63	17.9	5.62	1.95		
40 hr	33.91	30.5	5.98	4.33		
48 hr	36.60	40.8	6.30	5.99		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	—0.04	Sludge in oil:	200-mesh filter	None	
	Ti	+0.04		Centrifuge, vol %	Trace	
	Ag	—0.04	Tube deposits:	Total demerits	23	
	Steel	—0.04				
	Cu	—0.12				
	Mg	—0.34				
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Neut. no., hr to 1 mg KOH/g/8 hr	30		
	Ti	Brown		100°F vis, hr to 1 cs/8 hr	29	
	Ag	Yellow	Test Conditions			
	Steel	Peacock				
	Cu	Gold		Sample temperature, °F	428	
	Mg	L pitting		Sample volume, ml	200	
			Air rate, liters/hr	10		
			Condensate return	Yes		
(a) Evaluated in aluminum block.						

TEST NO. 401-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.29	—	3.21	0.00	3
16 hr	14.17	6.6	3.35	0.48	
24 hr	14.36	8.1	3.37	0.59	
40 hr	14.59	9.8	3.40	0.82	
48 hr	14.73	10.8	3.44	0.99	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.04		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	8
	Steel	+0.04			
	Cu	0.00			
	Mg	+0.02			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Blue & brown			
	Cu	Gold & green	Sample temperature, °F	401	
	Mg	Gray	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 401-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1^(a) AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.29	—	3.21	0.00	2
16 hr	14.20	6.8	3.35	0.56	
24 hr	14.38	8.2	3.37	0.49	
40 hr	14.66	10.3	3.42	0.72	
48 hr	14.78	11.2	3.44	0.90	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.10		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	10
	Steel	+0.10		Breakpoint Data	
	Cu	+0.02		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	0.00		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Test Conditions		
	Ti	Brown	Sample temperature, °F	401	
	Ag	L yellow		Sample volume, ml	
	Steel	Peacock		Air rate, liters/hr	
	Cu	Gold & green		Condensate return	
	Mg	Gray	Yes		
(a) 10 ppm iron added to sample as red iron oxide.					

TEST NO. 401-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1^(a) AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.29	—	3.21	0.00	2
16 hr	14.20	6.8	3.35	0.20	
24 hr	14.37	8.1	3.38	0.49	
40 hr	14.64	10.2	3.42	0.74	
48 hr	14.78	11.2	3.44	0.90	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits:	Total demerits	10
	Steel	—		Breakpoint Data	
	Cu	+0.02		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	0.00		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Test Conditions		
	Ti	Brown	Sample temperature, °F	401	
	Ag	L yellow		Sample volume, ml	
	Steel	Peacock		Air rate, liters/hr	
	Cu	Gold & green		Condensate return	
	Mg	No change			
(a) 50 ppm iron added to sample as red iron oxide.					

TEST NO. 401-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON G-68-1^(a) AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	13.29	—	3.21	0.00	2	
16 hr	14.16	6.5	3.35	0.54		
24 hr	14.34	7.9	3.37	0.56		
40 hr	14.61	9.9	3.42	0.76		
48 hr	14.75	11.0	3.45	0.92		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None	
	Ti	+0.04		Centrifuge, vol %	None	
	Ag	+0.02	Tube deposits:	Total demerits	13	
	Steel	+0.14				
	Cu	+0.06				
	Mg	+0.04				
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Neut. no., hr to 1 mg KOH/g/8 hr	48+		
	Ti	Brown		100°F vis, hr to 1 cs/8 hr	48+	
	Ag	L Yellow	Test Conditions			
	Steel	Peacock				
	Cu	Gold & green		Sample temperature, °F	401	
	Mg	No change		Sample volume, ml	200	
			Air rate, liters/hr	10		
			Condensate return	Yes		
(a) 100 ppm iron added to sample as red iron oxide.						

TEST NO. 402-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-920 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.01	—	3.42	0.15	3
16 hr	14.62	4.4	3.52	0.40	
24 hr	14.88	6.2	3.55	0.48	
40 hr	15.10	7.8	3.57	0.72	
48 hr	15.33	9.4	3.62	1.31	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil: 200-mesh filter Centrifuge, vol %	Trace	
	Ti	-0.04		None	
	Ag	-0.08	Tube deposits: Total demerits	49	
	Steel	+0.12			
	Cu	0.00			
	Mg	+0.08			
Metal discoloration, deposits, pitting, or etching	Al	No change	Breakpoint Data		
	Ti	No change	Neut. no., hr to 1 mg KOH/g/8 hr 100°F vis, hr to 1 cs/8 hr	48+	
	Ag	L. yellow		48+	
	Steel	Blue	Test Conditions		
	Cu	Orange	Sample temperature, °F	392	
	Mg	Brown	Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 403-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO 24-68 AT 374°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	27.27	—	5.45	0.18	7	
16 hr	28.57	4.8	5.53	0.54		
24 hr	29.21	7.1	5.57	1.01		
40 hr	31.29	14.7	5.74	1.07		
48 hr	32.87	20.5	5.91	0.20		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None	
	Ti	+0.02		Centrifuge, vol %	None	
	Ag	-0.04	Tube deposits:	Total demerits	3	
	Steel	0.00				
	Cu	-4.88				
	Mg	+0.02	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	48+		
				100°F vis, hr to 1 cs/8 hr	31	
			Test Conditions			
			Sample temperature, °F	374		
			Sample volume, ml	200		
		Air rate, liters/hr	10			
		Condensate return	Yes			

TEST NO. 404-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-24-68 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	27.27	—	5.45	0.18	5
16 hr	28.78	5.5	5.53	0.87	
24 hr	29.30	7.4	5.58	1.53	
40 hr	31.80	16.6	5.77	1.59	
48 hr	33.46	22.7	5.98	0.7	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	None
	Ti	0.04		Centrifuge, vol %	None
	Ag	0.02	Tube deposits:	Total demerits	5
	Steel	+0.04			
	Cu	-5.64			
	Mg	+0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	48+	
			100°F vis, hr to 1 cs/8 hr	29	
			Test Conditions		
	Al	No change	Sample temperature, °F	385	
	Ti	No change	Sample volume, ml	200	
	Ag	L yellow	Air rate, liters/hr	10	
	Steel	Blue & Violet	Condensate return	Yes	
	Cu	H etching			
	Mg	Gray			

TEST NO. 404-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON RAO-26-68 AT 335°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	12.39	—	3.19	2.54	4
16 hr	12.78	3.1	3.26	2.84	
24 hr	12.81	3.4	3.27	3.24	
40 hr	12.95	4.5	3.30	3.91	
48 hr	12.95	4.5	3.29	3.75	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	0.1
	Ag	+0.02	Tube deposits:	Total demerits	298
	Steel	+0.12			
	Cu	-0.38			
	Mg	+0.14	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	Brown	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	Brown		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Brown	Test Conditions		
	Steel	Brown & purple	Sample temperature, °F	385	
	Cu	Etching	Sample volume, ml	200	
	Mg	Brown	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 405-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-69-2 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.53		3.25	0.04	
16 hr	14.43	6.7	3.37	0.68	
24 hr	14.63	8.1	3.43	0.79	
40 hr	14.98	10.7	3.47	0.83	
48 hr	15.08	11.5	3.50	1.42	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.08		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	0
	Steel	0.00			
	Cu	+0.10			
	Mg	+0.04			
Metal discoloration, deposits, pitting, or etching	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	47	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	48+
	Ag	1 yellow	Test Conditions		
	Steel	1 blue	Sample temperature, °F	392	
	Cu	Orange	Sample volume, ml	200	
Mg	No change	Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 405-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-791 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.06	-	3.63	2.26	
16 hr	17.05	6.2	3.78	2.40	
24 hr	17.39	8.3	3.85	1.80	
40 hr	18.16	13.1	3.96	2.13	
48 hr	19.31	20.2	4.12	4.71	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	+0.08	Tube deposits:	Total demerits	4
	Steel	+0.04			
	Cu	-0.82			
	Mg	-0.14			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	41	
	Ti	No change		100°F vis, hr to 1 cs/8 hr	41
	Ag	No change	Test Conditions		
	Steel	Purple			
	Cu	L etching			
	Mg	Gray spots			
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 405-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-820 AT 392°F

	Vis, cs/100°F	100°F: Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	16.22	—	3.67	0.88	3	
16 hr	16.70	3.0	3.74	1.27		
24 hr	16.87	4.0	3.76	1.17		
40 hr	17.11	5.5	3.81	1.12		
48 hr	17.25	6.4	3.83	1.66		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None	
	Ti	+0.10		Centrifuge, vol %	Trace	
	Ag	+0.02	Tube deposits:	Total demerits	19	
	Steel	−0.02				
	Cu	+0.02				
	Mg	−0.06				
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Neut. no., hr to 1 mg KOH/g/8 hr	47		
	Ti	Yellow		100°F vis, hr to 1 cs/8 hr	48+	
	Ag	Tan	Test Conditions			
	Steel	L green				
	Cu	Gold		Sample temperature, °F	392	
	Mg	No change		Sample volume, ml	200	
			Air rate, liters/hr	10		
			Condensate return	Yes		

TEST NO. 405-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-882 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	15.93	-	3.63	0.84	3
16 hr	16.41	3.0	3.71	1.23	
24 hr	16.58	4.1	3.74	1.17	
40 hr	16.84	5.7	3.78	1.05	
48 hr	17.02	6.8	3.81	1.57	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.10	Sludge in oil:	200-mesh filter	None
	Ti	+0.16		Centrifuge, vol %	Trace
	Ag	0.00	Tube deposits:	Total demerits	16
	Steel	-0.02			
	Cu	-0.02			
	Mg	-0.04			
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Neut. no., hr to 1 mg KOH/g/8 hr	47	
	Ti	Yellow		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Tan	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	Gold	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 405-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-910 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.59	—	3.42	0.17	
16 hr	14.09	3.7	3.49	0.63	
24 hr	14.52	6.8	3.57	0.61	
40 hr	17.12	26.0	3.93	11.70	
48 hr	20.08	47.8	4.38	9.88	5
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	0.8
	Ag	+0.04	Tube deposits:	Total demerits	58
	Steel	0.00			
	Cu	-0.50			
	Mg	-0.08			
Metal discoloration, deposits, pitting, or etching:	No change		Breakpoint Data		
	Al		Neut. no., hr to 1 mg KOH/g/8 hr		32
	Ti	L yellow	100°F vis, hr to 1 cs/8 hr		31
	Ag	L yellow	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	L etching	Sample volume, ml	200	
Mg	Gray	Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 405-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-911 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.61	—	3.35	0.15	
16 hr	14.34	5.4	3.47	0.52	
24 hr	14.38	5.7	3.47	0.44	
40 hr	14.66	7.7	3.52	0.73	
48 hr	16.51	21.3	3.75	5.92	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	0.8
	Ag	-0.10	Tube deposits:	Total demerits	30
	Steel	+0.12		Breakpoint Data	
	Cu	-0.20		Neut. no., hr to 1 mg KOH/g/8 hr	40
Metal discoloration, deposits, pitting, or etching:	Mg	-0.04	100°F vis, hr to 1 cs/8 hr	43	
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	No change	Sample volume, ml	200	
	Ag	No change	Air rate, liters/hr	10	
	Steel	Blue	Condensate return	Yes	
Cu	L etching				
Mg	Brown				

TEST NO. 405-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-912 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.89	—	3.36	0.09	3
16 hr	14.86	7.0	3.52	0.57	
24 hr	15.09	8.6	3.56	0.48	
40 hr	15.29	10.1	3.58	0.66	
48 hr	15.45	11.2	3.62	1.16	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.04		Centrifuge, vol %	1.0
	Ag	0.02	Tube deposits:	Total demerits	36
	Steel	0.02		Breakpoint Data	
	Cu	-0.28		Neut. no., hr to 1 mg KOH/g/8 hr	48
	Mg	-0.06		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	No change	Sample temperature, °F	392	
	Ag	No change	Sample volume, ml	200	
	Steel	Blue	Air rate, liters/hr	10	
	Cu	L etching	Condensate return	Yes	
	Mg	Brown			

TEST NO. 405-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-917 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.14	—	3.76	1.63	3
16 hr	16.62	3.0	3.84	2.33	
24 hr	16.85	4.4	3.87	1.66	
40 hr	17.30	7.2	3.97	1.97	
48 hr	17.49	8.4	4.00	3.50	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.08		Centrifuge, vol %	Trace
	Ag	−0.06	Tube deposits:	Total demerits	13
	Steel	+0.08			
	Cu	−0.96			
	Mg	−0.02	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	41	
			100°F vis, hr to 1 cs/8 hr	48+	
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	No change	Sample volume, ml	200	
	Ag	No change	Air rate, liters/hr	10	
	Steel	Purple	Condensate return	Yes	
	Cu	L etching			
	Mg	Gray			

TEST NO. 406-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-69-2 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.53	—	3.25	0.04	4
16 hr	14.78	9.2	3.44	1.11	
24 hr	14.98	10.7	3.48	1.62	
40 hr	17.48	29.2	3.81	5.59	
48 hr	19.91	47.2	4.14	7.19	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	0
	Steel	0.00			
	Cu	-0.06			
	Mg	-0.06			
Metal discoloration, deposits, pitting, or etching:			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr	25	
			100°F vis, hr to 1 cs/8 hr	31	
			Test Conditions		
	Al	No change	Sample temperature, °F	410	
	Ti	No change	Sample volume, ml	200	
Ag	L yellow	Air rate, liters/hr	10		
Steel	Blue & yellow	Condensate return	Yes		
Cu	Orange				
Mg	No change				

TEST NO. 407-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-10 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	17.32	—	4.61	0.26	
16 hr	16.59	-4.2	4.36	1.00	
24 hr	16.25	-5.2	4.28	1.35	
40 hr	17.75	+2.5	4.17	14.86	
48 hr	20.84	+20.3	4.74	18.65	8
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.02	Sludge in oil:	200-mesh filter	None
	Ti	-0.02		Centrifuge, vol %	Trace
	Ag	+0.04	Tube deposits:	Total demerits	48
	Steel	+0.04			
	Cu	-0.96			
	Mg	-23.2			
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Breakpoint Data		
	Ti	Brown	Neut. no., hr to 1 mg KOH/g/8 hr	28	
	Ag	L brown	100°F vis, hr to 1 cs/8 hr	36	
	Steel	Blue	Test Conditions		
	Cu	M etching	Sample temperature, °F	392	
	Mg	H pitting	Sample volume, ml	200	
		Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 409-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.80	—	3.52	0.53	3
16 hr	15.11	9.5	3.75	1.66	
24 hr	14.90	8.0	3.65	1.91	
40 hr	14.84	7.5	3.65	2.47	
48 hr	14.75	6.9	3.68	2.74	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.36	Sludge in oil	200-mesh filter	Trace
	Ti	+0.34		Centrifuge, vol %	0.2
	Ag	+0.16	Tube deposits:	Total demerits	381
	Steel	+0.16			
	Cu	-0.08			
	Mg	+0.18			
Metal discoloration, deposits, pitting, or etching	Al	Black deposit	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	Black deposit		100°F vis, hr to 1 cs/8 hr	48+
	Ag	Brown	Test Conditions		
	Steel	Brown-black	Sample temperature, °F	392	
	Cu	Brown-black	Sample volume, ml	200	
	Mg	Brown-black	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 409-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-18 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	16.80	-	4.30	0.12	5
16 hr	17.05	+1.5	4.28	1.46	
24 hr	16.93	+0.8	4.24	1.86	
40 hr	16.75	-0.3	4.06	7.91	
48 hr	18.55	+10.4	4.30	13.29	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	Trace
	Ag	-0.02	Tube deposits:	Total demerits	76
	Steel	+0.02		Breakpoint Data	
	Cu	-0.22		Neut. no., hr to 1 mg KOH/g/8 hr	27
	Mg	+0.02		100°F vis, hr to 1 cs/8 hr	41
Metal discoloration, deposits, pitting, or etching:	Al	L green	Test Conditions		
	Ti	Green	Sample temperature, °F	392	
	Ag	L green		Sample volume, ml	
	Steel	Yellow		200	
	Cu	L etching		Air rate, liters/hr	
	Mg	L yellow		10	
			Condensate return	Yes	

TEST NO. 417-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-69-5 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.57	~	3.25	0.01	
16 hr	14.45	6.5	3.40	0.52	
24 hr	14.65	8.0	3.45	0.56	
40 hr	14.96	10.2	3.48	0.82	
48 hr	15.11	11.3	3.50	1.49	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil	200-mesh filter	None
	Ti	-0.14		Centrifuge, vol	None
	Ag	-0.04	Tube deposits	Total demerits	1
	Steel	0.00		Breakpoint Data	
	Cu	-0.14		Neut. no., hr to 1 mg KOH/g/8 hr	47
Mg	+0.06	100°F vis, hr to 1 cs/8 hr	48+		
Metal discoloration, deposits, pitting, or etching	Al	No change	Test Conditions		
	Ti	1 yellow	Sample temperature, °F	392	
	Ag	No change		Sample volume, ml	
	Steel	1 green		200	
	Cu	Gold		Air rate, liters/hr	
	Mg	No change		10	
			Condensate return	Yes	

TEST NO. 417-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-69-10 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.47	—	3.24	0.03	3
16 hr	14.37	6.7	3.37	0.61	
24 hr	14.57	8.2	3.43	0.91	
40 hr	14.89	10.5	3.45	1.17	
48 hr	15.02	11.5	3.48	1.37	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.08	Sludge in oil:	200-mesh filter	None
	Ti	+0.06		Centrifuge, vol %	None
	Ag	−0.02	Tube deposits:	Total demerits	0
	Steel	−0.04			
	Cu	−0.08			
	Mg	0.00	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	L yellow		100°F vis, hr to 1 cs/8 hr	48+
	Ag	No change	Test Conditions		
	Steel	L green	Sample temperature, °F	392	
	Cu	Gold	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 417-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-919 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	23.52	—	5.16	0.12	6
16 hr	24.02	2.1	5.22	0.61	
24 hr	24.93	6.0	5.23	2.32	
40 hr	30.79	30.9	5.92	7.29	
48 hr	34.70	47.5	6.42	13.06	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.04	Sludge in oil	200-mesh filter	None
	Ti	+0.08		Centrifuge, vol %	None
	Ag	−0.04	Tube deposits	Total demerits	7
	Steel	−0.08			
	Cu	−0.94			
	Mg	−0.10	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	17	
	Ti	L yellow		100°F vis, hr to 1 cs/8 hr	22
	Ag	No change	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	L etching	Sample volume, ml	200	
Mg	No change	Air rate, liters/hr	10		
		Condensate return	Yes		

TEST NO. 417-4, RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-922 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	14.27	—	3.39	0.06	3	
16 hr	15.16	6.2	3.52	0.75		
24 hr	15.38	7.8	3.56	1.00		
40 hr	15.69	10.0	3.61	1.28		
48 hr	15.84	11.0	3.64	1.41		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace	
	Ti	-0.06		Centrifuge, vol %	0.2	
	Ag	0.00	Tube deposits:	Total demerits	62	
	Steel	+0.02		Breakpoint Data		
	Cu	-0.12		Neut. no., hr to 1 mg KOH/g/8 hr	48+	
Mg	+0.08	100°F vis, hr to 1 cs/8 hr	48+			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions			
	Ti	L yellow	Sample temperature, °F	392		
	Ag	No change		Sample volume, ml	200	
	Steel	L green			Air rate, liters/hr	10
	Cu	Tan				Condensate return
Mg	L brown					

TEST NO. 417-5, RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-923 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.76	—	3.36	0.29	
16 hr	14.22	3.3	3.44	0.46	
24 hr	14.36	4.4	3.46	0.47	
40 hr	14.61	6.2	3.50	0.70	
48 hr	14.88	8.1	3.54	2.13	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.10	Sludge in oil	200-mesh filter	1.4
	Ti	0.08		Centrifuge, vol %	Trace
	Ag	-0.12	Tube deposits	Total demerits	102
	Steel	-0.02		Breakpoint Data	
	Cu	0.22		Neut. no., hr to 1 mg KOH/g/8 hr	45
Mg	-0.02	100°F vis, hr to 1 cs/8 hr	48+		
Metal discoloration, deposits, pitting, or etching	Al	No change	Test Conditions		
	Ti	1 yellow	Sample temperature, °F	392	
	Ag	No change	Sample volume, ml	200	
	Steel	Blue	Air rate, liters/hr	10	
	Cu	1 etching	Condensate return	Yes	
	Mg	Gray			

TEST NO. 417-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-939 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.59	—	3.27	0.19	
16 hr	14.32	5.4	3.39	0.39	
24 hr	14.52	6.8	3.40	0.53	
40 hr	14.66	7.9	3.44	0.70	
48 hr	14.79	8.8	3.46	0.94	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :			Sludge in oil:	200-mesh filter	Trace
				Centrifuge, vol %	Trace
			Tube deposits:	Total demerits	105
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 417-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-940 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.45	—	3.28	0.08	
16 hr	14.24	5.9	3.38	0.21	
24 hr	14.35	6.7	3.41	0.21	
40 hr	14.47	7.6	3.39	0.34	
48 hr	14.56	8.3	3.44	0.81	3
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :			Sludge in oil:	200-mesh filter	Trace
				Centrifuge, vol	None
			Tube deposits:	Total demerits	52
			Breakpoint Data		
			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
			Sample temperature, °F	392	
			Sample volume, ml	200	
			Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 418-1, RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-69-5 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	13.57	—	3.25	0.01	4
16 hr	14.74	8.6	3.43	1.19	
24 hr	15.04	10.8	3.46	1.64	
40 hr	18.45	36.0	3.91	6.66	
48 hr	21.99	62.0	4.39	10.35	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	None
	Ti	-0.02		Centrifuge, vol %	None
	Ag	-0.06	Tube deposits:	Total demerits	2
	Steel	+0.04			
	Cu	-0.04			
	Mg	-0.08	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	24	
			100°F vis, hr to 1 cs/8 hr	30	
			Test Conditions		
	Al	No change	Sample temperature, °F	410	
	Ti	L yellow	Sample volume, ml	200	
Ag	L yellow	Air rate, liters/hr	10		
Steel	L green	Condensate return	Yes		
Cu	Gold				
Mg	Gray				

TEST NO. 418-2, RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-69-10 AT 410°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.47	-	3.24	0.03	
16 hr	14.67	8.9	3.43	1.12	
24 hr	14.96	11.1	3.44	1.53	
40 hr	17.39	29.1	3.79	5.68	
48 hr	20.23	50.2	4.18	9.48	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ²	Al	0.02	Sludge in oil	200-mesh filter	None
	Ti	0.06		Centrifuge, vol %	None
	Ag	+0.04	Tube deposits	Total demerits	2
	Steel	+0.08			
	Cu	0.14			
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		25
	Ti	1 yellow	100°F vis, hr to 1 cs/8 hr		32
	Ag	1 yellow	Test Conditions		
	Steel	Brown	Sam. temperature, °F	410	
	Cu	Gold	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 419-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-942 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	14.07	—	3.63	0.17	5
16 hr	14.22	1.1	3.63	1.08	
24 hr	14.18	0.8	3.61	1.26	
40 hr	14.88	5.8	3.60	8.27	
48 hr	16.90	20.1	3.86	15.63	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.14	Tube deposits:	Total demerits	24
	Steel	-0.10			
	Cu	-0.52			
	Mg	-0.92	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		31
	Ti	L yellow	100°F vis. hr to 1 cs/8 hr		40
	Ag	Tan	Test Conditions		
	Steel	Purple	Sample temperature, °F	392	
	Cu	L etching	Sample volume, ml	200	
	Mg	L etching & pitting	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 419-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-943 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	13.22	—	3.39	(a)		
16 hr	13.66	3.3	3.46	1.14		
24 hr	13.78	4.2	3.47	3.60		
40 hr	15.37	16.3	3.69	9.20		
48 hr	17.20	30.1	3.99	16.00	4	
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	None	
	Ti	0.00		Centrifuge, vol %	None	
	Ag	-0.18	Tube deposits:	Total demerits	12	
	Steel	-0.12				
	Cu	-0.70				
	Mg	-0.82				
Metal discoloration, deposits, pitting, or etching:	Al	No change	Breakpoint Data			
	Ti	L yellow	Neut. no., hr to 1 mg KOH/g/8 hr	15		
	Ag	Tan	100°F vis, hr to 1 cs/8 hr	35		
	Steel	Purple	Test Conditions			
	Cu	L etching	Sample temperature, °F	392		
	Mg	L pitting	Sample volume, ml	200		
			Air rate, liters/hr	10		
			Condensate return	Yes		
(a) Insufficient sample to determine initial neutralization number.						

TEST NO. 419-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-963 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss. wt, %
Initial	13.31	—	3.37	0.41	5
16 hr	13.71	3.0	3.46	1.62	
24 hr	13.88	4.3	3.49	2.09	
40 hr	15.86	19.2	3.78	11.67	
48 hr	17.38	30.6	4.02	17.88	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.22	Tube deposits:	Total demerits	4
	Steel	-0.08			
	Cu	-5.20			
	Mg	-0.12	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	25	
			100°F vis, hr to 1 cs/8 hr	34	
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	L yellow	Sample volume, ml	200	
	Ag	L etching	Air rate, liters/hr	10	
	Steel	Purple	Condensate return	Yes	
	Cu	M etching			
	Mg	Gray			

TEST NO. 432-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-972 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	18.09	—	4.13	3.61	3
16 hr	19.19	6.1	4.27	3.61	
24 hr	19.65	8.6	4.33	3.88	
40 hr	20.56	13.7	4.34	4.12	
48 hr	21.09	16.6	4.53	5.17	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	−0.02	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	+0.08	Tube deposits:	Total demerits	5
	Steel	+0.10		Breakpoint Data	
	Cu	−0.40		Neut. no., hr to 1 mg KOH/g/8 hr	45
	Mg	−0.06		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	Tan	Sample temperature, °F	392	
	Ag	L yellow	Sample volume, ml	200	
	Steel	Purple	Air rate, liters/hr	10	
	Cu	L etching	Condensate return	Yes	
	Mg	No change			

TEST NO. 432-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-944 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.24	—	3.25	0.43	1
16 hr	13.66	3.2	3.32	0.61	
24 hr	13.95	5.4	3.38	0.61	
40 hr	14.24	7.6	3.39	1.03	
48 hr	14.27	7.8	3.43	1.32	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.08		Centrifuge, vol %	0.8
	Ag	+0.14	Tube deposits:	Total demerits	24
	Steel	0.00		Breakpoint Data	
	Cu	-0.02		Neut. no., hr to 1 mg KOH/g/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Mg	+0.14	100°F vis, hr to 1 cs/8 hr		48+
	Al	No change	Test Conditions		
	Ti	Tan	Sample temperature, °F	392	
	Ag	N. C.	Sample volume, ml	200	
	Steel	Brown-purple	Air rate, liters/hr	10	
	Cu	Gold	Condensate return	Yes	
	Mg	Gray			

TEST NO. 432-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-945 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.35	—	3.32	0.10	2
16 hr	14.05	5.2	3.44	0.53	
24 hr	14.16	6.1	3.46	0.70	
40 hr	14.43	8.1	3.52	1.09	
48 hr	15.96	19.6	3.72	5.34	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.10		Centrifuge, vol %	0.3
	Ag	0.00	Tube deposits:	Total demerits	36
	Steel	+0.12		Breakpoint Data	
	Cu	-0.16		Neut. no., hr to 1 mg KOH/g/8 hr	42
Metal discoloration, deposits, pitting, or etching:	Mg	+0.08	100°F vis, hr to 1 cs/8 hr		45
	Al	Yellow	Test Conditions		
	Ti	Brown-purple	Sample temperature, °F	392	
	Ag	L tan	Sample volume, ml	200	
	Steel	Blue-green	Air rate, liters/hr	10	
	Cu	Brown-gold	Condensate return	Yes	
	Mg	Yellow			

TEST NO. 432-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-946 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	13.94	—	3.59	0.25	5	
16 hr	14.05	0.8	3.60	1.12		
24 hr	14.46	3.7	3.61	2.96		
40 hr	16.95	21.6	4.09	13.41		
48 hr	18.50	32.7	4.32	16.68		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	+0.06	Sludge in oil:	200-mesh filter	Trace	
	Ti	+0.04		Centrifuge, vol %	Trace	
	Ag	+0.04		Tube deposits:	Total demerits	47
	Steel	+0.08				
	Cu	-8.70				
	Mg	-0.22	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching:	Al	Yellow	Neut. no., hr to 1 mg KOH/g/8 hr	17		
	Ti	Brown-purple		100°F vis, hr to 1 cs/8 hr	31	
	Ag	L tan	Test Conditions			
	Steel	Blue-green	Sample temperature, °F	392		
	Cu	H etching	Sample volume, ml	200		
Mg	L etching & pitting	Air rate, liters/hr	10			
		Condensate return	Yes			

TEST NO. 432-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-964 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	13.81	—	3.45	0.20	3	
16 hr	14.01	1.4	3.46	0.46		
24 hr	14.52	5.1	3.57	1.44		
40 hr	16.59	20.1	3.90	5.21		
48 hr	19.46	40.9	4.30	11.12		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	-0.06	Sludge in oil:	200-mesh filter	Trace	
	Ti	-0.04		Centrifuge, vol %	0.6	
	Ag	+0.10		Tube deposits:	Total demerits	20
	Steel	-0.04				
	Cu	-0.48				
	Mg	-0.06	Breakpoint Data			
Metal discoloration, deposits, pitting, or etching:	Al	No charge	Neut. no., hr to 1 mg KOH/g/8 hr	21		
	Ti	Tan		100°F vis, hr to 1 cs/8 hr	31	
	Ag	No charge	Test Conditions			
	Steel	Blue	Sample temperature, °F	392		
	Cu	L etching	Sample volume, ml	200		
Mg	L yellow	Air rate, liters/hr	10			
		Condensate return	Yes			

TEST NO. 432-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-965 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.91	—	3.42	0.15	1
16 hr	14.28	2.7	3.45	0.45	
24 hr	14.77	6.2	3.47	0.63	
40 hr	15.09	8.5	3.61	0.86	
48 hr	15.15	8.9	3.63	1.03	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	-0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	-0.02		Centrifuge, vol %	0.3
	Ag	-0.14	Tube deposits:	Total demerits	34
	Steel	+0.08			
	Cu	-0.06			
	Mg	+0.10	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr	48+	
			100°F vis, hr to 1 cs/8 hr	48+	
	Al	No change	Test Conditions		
	Ti	Tan	Sample temperature, °F	392	
	Ag	No change	Sample volume, ml	200	
	Steel	Blue	Air rate, liters/hr	10	
	Cu	Gold	Condensate return	Yes	
	Mg	L yellow			

TEST NO. 432-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-966 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	13.60	—	3.33	0.08	3
16 hr	14.46	6.3	3.42	0.34	
24 hr	14.50	6.6	3.42	0.53	
40 hr	14.83	9.0	3.51	0.72	
48 hr	14.90	9.6	3.53	0.74	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.08	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.08		Centrifuge, vol %	0.2
	Ag	-0.04	Tube deposits:	Total demerits	38
	Steel	+0.02			
	Cu	+0.06			
	Mg	0.00	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	Tan		100°F vis, hr to 1 cs/8 hr	48+
	Ag	L yellow	Test Conditions		
	Steel	Blue	Sample temperature, °F	392	
	Cu	Gold-pink	Sample volume, ml	200	
	Mg	L yellow	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 535-1, RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-25

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	28.76	—	5.36	0.00	
16 hr	29.45	2.4	5.50	0.17	
24 hr	29.77	3.4	5.53	0.22	
40 hr	30.79	7.1	5.62	0.29	
48 hr	31.15	8.3	5.62	0.34	2
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	Trace
	Ag	+0.04	Tube deposits:	Total demerits	21
	Steel	0.00		Breakpoint Data	
	Cu	-0.04		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	-0.06		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	Tan	Sample temperature, °F	392	
	Ag	Yellow		Sample volume, ml	200
	Steel	Peacock		Air rate, liters/hr	10
	Cu	Brown		Condensate return	Yes
	Mg	Slight etching			

TEST NO. 535-2, RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-25

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	28.76	—	5.36	0.00	
16 hr	29.72	3.3	5.50	0.17	
24 hr	30.31	5.4	5.56	0.22	
40 hr	30.80	7.1	5.62	0.28	
48 hr	31.11	8.2	5.65	0.33	4
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	+0.06	Tube deposits:	Total demerits	22
	Steel	0.00		Breakpoint Data	
	Cu	-0.04		Neut. no., hr to 1 mg KOH/g/8 hr	48+
	Mg	0.00		100°F vis, hr to 1 cs/8 hr	48+
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	Tan	Sample temperature, °F	392	
	Ag	Yellow		Sample volume, ml	200
	Steel	Peacock		Air rate, liters/hr	10
	Cu	Brown		Condensate return	Yes
	Mg	Slight etching			

TEST NO. 535-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-15

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	27.20	—	5.04	0.02	3
16 hr	29.55	8.6	5.35	0.33	
24 hr	30.30	11.4	5.41	0.47	
40 hr	31.01	14.0	5.52	0.62	
48 hr	31.40	15.4	5.56	0.67	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.02		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	2
	Steel	0.00			
	Cu	-0.16			
	Mg	0.00	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	Tan		100°F vis, hr to 1 cs/8 hr	48+
	Ag	No change	Test Conditions		
	Steel	Brown-blue	Sample temperature, °F	392	
	Cu	Yellow-orange	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 535-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-15

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt. %
Initial	27.20	—	5.04	0.02	4
16 hr	29.58	8.7	5.34	0.31	
24 hr	30.29	11.4	5.44	0.45	
40 hr	30.96	13.8	5.53	0.60	
48 hr	31.38	15.4	5.56	0.66	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.08	Tube deposits:	Total demerits	3
	Steel	0.00			
	Cu	-0.14			
	Mg	-0.08	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr		48+
	Ti	Tan	100°F vis, hr to 1 cs/8 hr		48+
	Ag	No change	Test Conditions		
	Steel	Brown-blue	Sample temperature, °F	392	
	Cu	Yellow-orange	Sample volume, ml	200	
	Mg	Slight etching	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 535-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-16

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %	
Initial	26.69	—	5.13	0.20	4	
16 hr	29.05	8.8	5.45	0.50		
24 hr	29.60	10.9	5.47	0.65		
40 hr	30.15	13.0	5.57	0.81		
48 hr	30.65	14.8	5.61	0.91		
Metal Specimen Data			Test Cell Data			
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None	
	Ti	0.00		Centrifuge, vol %	None	
	Ag	0.00	Tube deposits:	Total demerits	12	
	Steel	0.00		Breakpoint Data		
	Cu	0.00		Neut. no., hr to 1 mg KOH/g/8 hr	48+	
Metal discoloration, deposits, pitting, or etching:	Mg	-0.02	100°F vis, hr to 1 cs/8 hr			48+
	Al	No change	Test Conditions			
	Ti	Tan	Sample temperature, °F	392		
	Ag	L yellow	Sample volume, ml	200		
	Steel	Green-blue	Air rate, liters/hr	10		
Cu	Orange	Condensate return	Yes			
Mg	No change					

TEST NO. 535-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-16

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	26.69	—	5.13	0.20	4
16 hr	28.85	8.1	5.40	0.50	
24 hr	29.61	10.9	5.49	0.63	
40 hr	30.31	13.6	5.57	0.83	
48 hr	30.58	14.6	5.61	0.93	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	13
	Steel	0.00		Breakpoint Data	
	Cu	+0.06		Neut. no., hr to 1 mg KOH/g/8 hr	48+
Metal discoloration, deposits, pitting, or etching	Mg	+0.02	100°F vis, hr to 1 cs/8 hr		48+
	Al	No change	Test Conditions		
	Ti	Tan	Sample temperature, °F	392	
	Ag	L yellow	Sample volume, ml	200	
	Steel	Green-blue	Air rate, liters/hr	10	
Cu	Orange	Condensate return	Yes		
Mg	No change				

TEST NO. 535-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-9

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	28.16	--	5.31	0.16	4
16 hr	30.29	7.6	5.63	0.42	
24 hr	31.06	10.3	5.68	0.46	
40 hr	31.34	11.3	5.77	0.52	
48 hr	31.81	13.0	5.80	0.54	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.02	Tube deposits:	Total demerits	15
	Steel	0.00			
	Cu	- 0.08			
	Mg	0.00	Breakpoint Data		
Metal discoloration deposits, pitting, or etching:			Neut. no., hr to 1 mg KOH/g/8 hr		48+
			100°F vis, hr to 1 cs/8 hr		48+
			Test Conditions		
	Al	No change	Sample temperature, °F	392	
	Ti	L brown	Sample volume, ml	200	
Ag	L yellow	Air rate, liters/hr	10		
Steel	Green-blue	Condensate return	Yes		
Cu	Orange				
Mg	No change				

TEST NO. 535-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-9

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	28.16	-	5.31	0.16	3
16 hr	30.39	7.9	5.61	0.40	
24 hr	31.06	10.3	5.66	0.45	
40 hr	31.43	11.6	5.77	0.50	
48 hr	31.69	12.5	5.79	0.53	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ²	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.00	Tube deposits:	Total demerits	15
	Steel	0.00			
	Cu	0.00			
	Mg	0.06	Breakpoint Data		
Metal discoloration, deposits, pitting, or etching	Al	No change	Neut. no., hr to 1 mg KOH/g/8 hr	48+	
	Ti	1 brown		100°F vis, hr to 1 cs/8 hr	48+
	Ag	1 yellow	Test Conditions		
	Steel	Green-blue	Sample temperature, °F	392	
	Cu	Orange	Sample volume, ml	200	
	Mg	No change	Air rate, liters/hr	10	
			Condensate return	Yes	

TEST NO. 540 1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON Q-67-10

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt, %
Initial	17.32	—	4.61	0.26	5
16 hr	16.63	-4.0	4.36	0.99	
24 hr	15.96	-7.9	4.16	1.84	
40 hr	17.91	+3.4	4.16	14.68	
48 hr	21.07	+21.7	4.78	18.80	
Metal Specimen Data			Test Cell Data		
Weight change, mg/cm ² :	Al	+0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	-0.04	Tube deposits:	Total demerits	55
	Steel	+0.02		Breakpoint Data	
	Cu	-0.88		Neut. no., hr to 1 mg KOH/g/8 hr	22
	Mg	-35.76		100°F vis, hr to 1 cs/8 hr	33
Metal discoloration, deposits, pitting, or etching:	Al	Yellow	Test Conditions		
	Ti	Brown	Sample temperature, °F	392	
	Ag	Yellow-brown	Sample volume, ml	200	
	Steel	L green-blue	Air rate, liters/hr	10	
	Cu	Slight etching	Condensate return	Yes	
	Mg	Severe etching			

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D		
(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)		
1. ORIGINATING ACTIVITY (Corporate author) Southwest Research Institute 8500 Cuiebra Road San Antonio, Texas 78228		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED
		2b. GROUP
3. REPORT TITLE EVALUATION STUDY OF THE OXIDATION-CORROSION-DEPOSITION CHARACTERISTICS OF AIRCRAFT TURBINE ENGINE LUBRICANTS--Volume II		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Phase Report, February 1, 1969 through April 15, 1970		
5. AUTHOR(S) (First name, middle initial, last name) J. P. Cuellar B. B. Baber		
6. REPORT DATE October 1970	7a. TOTAL NO. OF PAGES 145	7b. NO. OF REFS None
8a. CONTRACT OR GRANT NO. F33615-69-C-1295	9a. ORIGINATOR'S REPORT NUMBER(S) RS-547	
b. PROJECT NO. 3048	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) AFAPL-TR-70-59, Volume II	
c.		
d.		
10. DISTRIBUTION STATEMENT This document is subject to special export controls and each transmittal to foreign governments or foreign nationals may be made only with prior approval of the Fuel, Lubrication, and Hazards Division (APF), Air Force Aero Propulsion Laboratory, Wright-Patterson Air Force Base, Ohio 45433.		
11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY Air Force Aero Propulsion Laboratory Air Force Systems Command Wright-Patterson Air Force Base, Ohio	
13. ABSTRACT Volume II of this report contains a compilation of the individual test data sheets for all tests included in Volume I. The data sheets are presented in order of test number.		

DD FORM 1473
1 NOV 65

UNCLASSIFIED

Security Classification

UNCLASSIFIED

Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Lubricants Oxidation-Corrosion Deposition Aircraft Turbine Engines Test Methods						

UNCLASSIFIED

Security Classification